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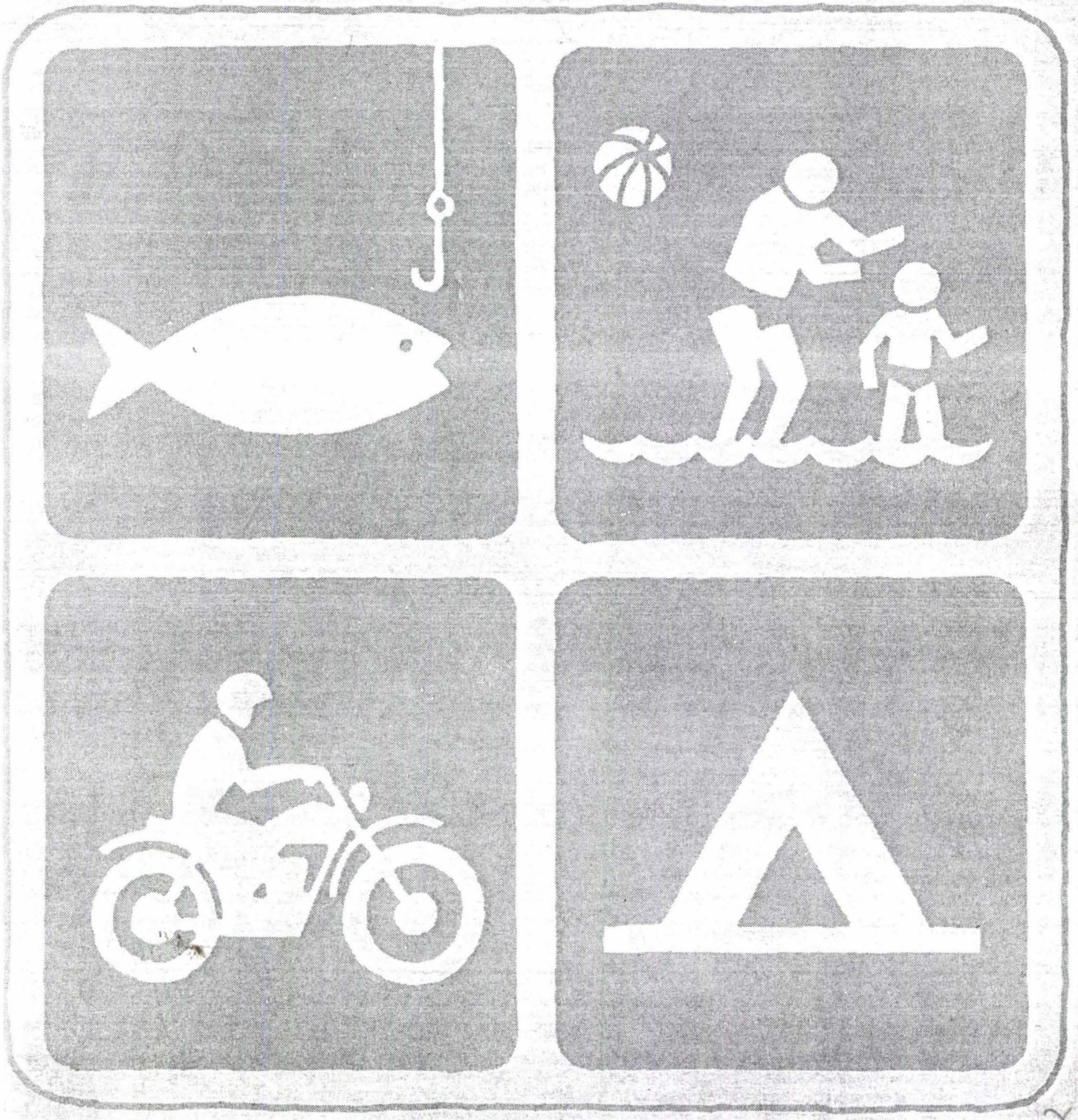
United States Department of Agriculture

Forest Service Region Five

Angeles National Forest

Littlerock Canyon

Recreation Use Study and Recommended Management Actions



LITTLEROCK CANYON RECREATION USE STUDY

AND

RECOMMEND MANAGEMENT ACTIONS

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LITTLEROCK CANYON RECREATION USE STUDY AND RECOMMENDED MANAGEMENT ACTIONS

MARCH 1983

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PROFESSIONAL DEVELOPMENT

FOR

OUTDOOR RECREATION MANAGEMENT

Clemson University

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ABSTRACT

This study describes recreation use and the related problems within Littlerock Canyon on the Valyermo Ranger District of the Angeles National Forest. Littlerock Canyon provides primarily day use recreation opportunities that are currently being used beyond capacity limits. Serious management problems of user conflicts, resource degradation, undesirable behavior, and user safety have evolved from a variety of factors. The analysis of the use and related factors are summarized in findings. Conclusions and recommendations are provided for implementation by management for resolution of recognized problems.

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CHAPTER I

INTRODUCTION AND STATEMENT OF THE PROBLEM

A. Introduction

Littlerock Canyon is located in the northwest portion of the Valyermo Ranger District, Angeles National Forest, approximately seven miles southwest of the town of Littlerock. The canyon drains north into the Antelope Valley from the northern slopes of the San Gabriel Mountains. The vegetative cover is mixed desert chaparral and pinyon/juniper. Summers are hot and dry from desert influences.

Access into the canyon is provided by Los Angeles County Road (Cheseboro Road) from State Highway 138 south to Littlerock Dam. Beyond the dam, access is by Forest Service road (5N04), the first mile being paved. Elevation ranges from 3268 feet above sea level near the dam to 4200 feet at Little Cedars Campground.

Littlerock Dam occupies the mouth of Littlerock Canyon, owned and maintained by Palmdale and Littlerock Irrigation Districts under special use permit from the Forest Service. The dam provides water storage for irrigation purposes which in turn provides a large body of water that attracts many recreation visitors. Normally the reservoir nearly empties by the middle of summer.

Three Forest Service campgrounds are adjacent to the southwest shore of the reservoir. Three additional Forest Service campgrounds are at locations approximately one, seven, and nine miles up canyon.

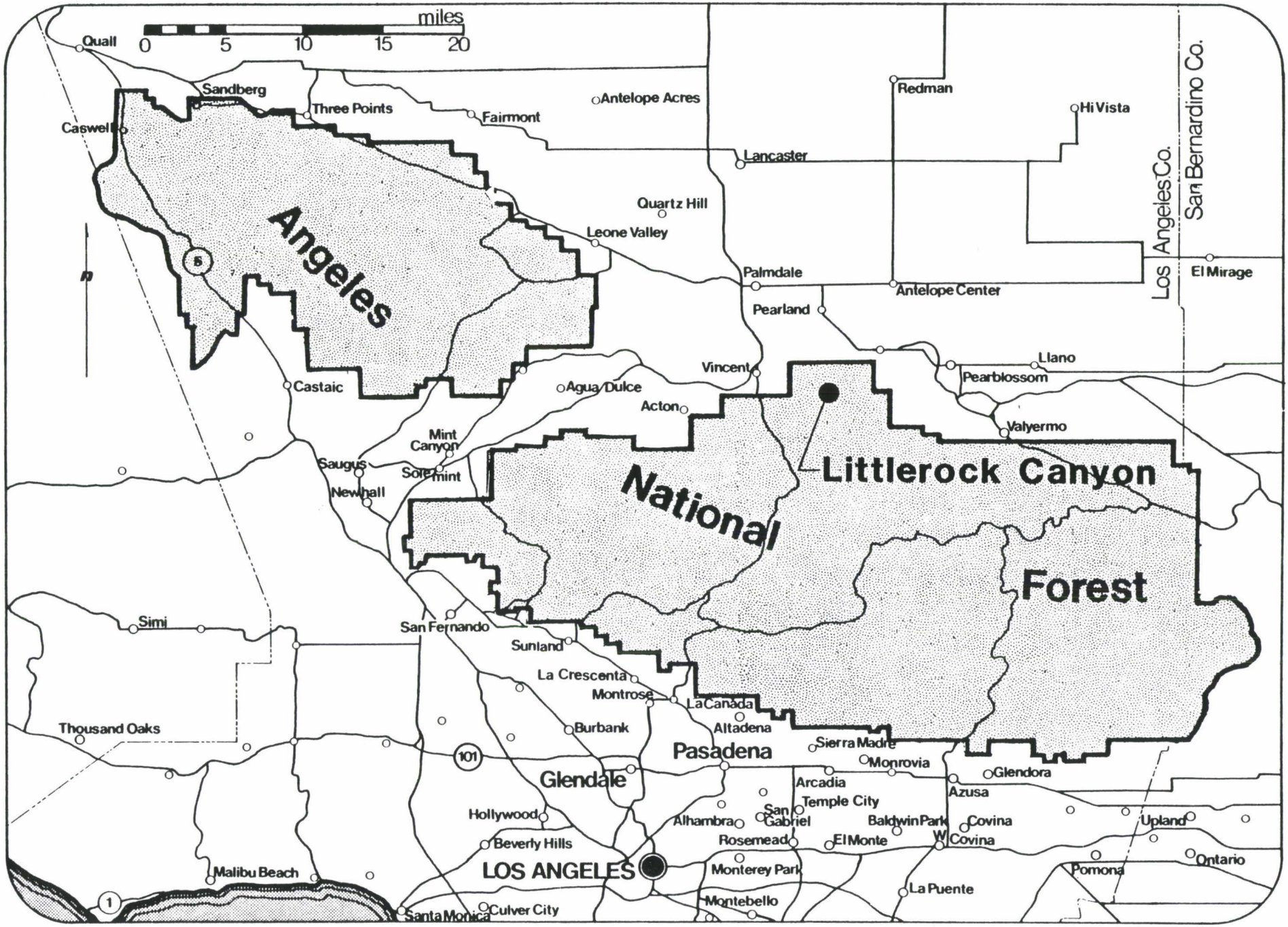


figure 1

Vicinity Map

A resort, under special use permit from the Forest Service, occupies an area on the western lake shore between the first and second campground. The resort provides food service, store, boat rentals, and a small parking area for self contained camping vehicles. Occasionally cabin rentals are available to the public.

One parking area with restroom facilities is maintained by the Forest Service for day use activities on the west side of the lake.

Recreation use in Littlerock Canyon occurs year-long. The heavy use season starts when the weather begins to get warm in April. Use diminishes in August when the weather gets extremely hot and the reservoir gets very low. Use is heaviest on weekend days and holidays. Activities include camping, picnicking, fishing, waterplay, ORV activity, sunbathing and other day use pastimes.

Recreation use and activities have increased over the past eight years (1974 through 1982) to a point where they are causing administrative problems for the Forest Service and conflicts between recreationists. Heavy vandalism, disorderly conduct, user conflicts, facility deterioration, undesirable public behavior and congestion are administrative problems which need solutions if recreation use in the canyon is to remain manageable. The problems are greatly reducing the quality of recreation experiences by those seeking traditional forest outings.

Because of the current situation, the Forest Service has identified opportunities, issues and concerns from public contacts, public correspondence, Forest Service meetings, and professional judgments of operation personnel. These opportunities, issues and concerns are summarized as follows:

1. User Safety
    a) Road congestion
    b) Reckless driving
    c) Inadequate design standards

2. Resource Damage to Soil and Vegetation
    a) ORV abuse
    b) Facility overcrowding
    c) Outmoded and deteriorated facilities

3. Conflicts Between User Groups

4. Depreciative Behavior
    a) Unruly groups
    b) Vandalism
    c) Intoxication
    d) Criminal activities

5. Inadequate Coordination of Management Controls

B. Statement of the Problem

The objective of this study is to develop a Recreation Management Plan for Littlerock Canyon that supports current management direction. The study will focus on the opportunities, issues and concerns outlined in the introduction, and recommend actions.

1. Current management direction for Littlerock Canyon is to:

    a) Provide a range of recreation opportunities.
    b) Manage use to fit the capability and suitability of the land.
    c) Minimize conflicts between users.

2. In support of this management direction, specific recommendations to be made are:

    a) Recreation opportunities to be emphasized
    b) Locations of recreation activities
    c) Use capacities
    d) Design criteria for recreation support facilities
    e) Coordinated management controls
    f) Operation schedules
    g) Staffing criteria

C. Delimitations

This study will concern itself with activities adjacent to Littlerock Reservoir and up canyon, about seven miles, to include Little Cedars Campground. It will involve developed and dispersed area activity.

D. Limitations

1. Limitations for this study are outlined as follows:

   a) Inventory data were obtained from Forest employees. Opinions and thoughts were not asked of recreation users or non-Forest Service employees.

   b) Parking area capacities were determined by estimating distances. No exact measurements were made.

   c) People per vehicle data were based on professional judgment of individuals working within the study area and correlated with actual counts made at the entrance station.

   d) Compatability data were based on professional judgment.

   e) This study is broad in scope and does not include detailed information on individual recreation activity. Activities are listed by broad categories such as day use.

E. Definitions

Day Use Recreation - Recreation activity such as picnicking and water play that does not involve an overnight stay.

Developed Recreation Areas - Lands and waters developed for intensive recreation use such as campgrounds and picnic grounds.

Dispersed Recreation Areas - Lands and waters not developed for intensive recreation use.

ORV - Off-Road Vehicle - Any vehicle used for transportation off of roads (such as motorcycles and 4-wheel drives).

Riparian Area - The area along a natural water course or next to a body of water that has a water-influenced ecosystem.

ROS - Recreation Opportunities Spectrum - Range of opportunities for outdoor recreation from primitive to urban experiences.

RVD - Recreation Visitor Day - 12 hours of recreation use.

Visual Resource - Scenery - the visual element of the environment.

CHAPTER II

REVIEW OF LITERATURE

Recreation use and related activity within Littlerock Canyon has increased over the years to the point that major problems exist. High occurrence of vandalism, disorderly conduct, recreation user conflict, resource damage, and congestion are problems faced by the Forest Service. Outside agency law enforcement support has become the rule rather than the exception. Achieving the traditional family oriented recreation experience has become a difficult task. It is the purpose of this study to help resolve the situation by the development of a recreation management plan. This study will analyze the existing situation and recommend solutions within the constraints of resource availability.

Chapter II summarizes literature relevant to Littlerock Canyon regarding the following subjects:

Management Goals

Resource Effects

Recreation Use

Management Controls

Design Criteria

Looking at the existing situation will help guide this study in meeting its objectives and goals.

A. Management Goals - Numerous documents addressing Littlerock Canyon were reviewed. Of these, the two latest efforts state basic objectives and goals for the area.

Many of the early and more specific efforts were culminated in the "Operation Plan for Littlerock Canyon" (1980). Critical issues and concerns were identified and management action criteria were developed. The plan called for an action plan consisting of three phases of which two were developed and implemented in varying degrees. Those actions implemented include:

Evaluating renewal of the resort permit which provides for alcohol sales.

Improving cooperation with the Highway Patrol and the Sheriff's Department.

Assigning a special area supervisor to Littlerock Canyon.

Converting an abused campground to an ORV staging area.

Increasing patrols during peak use periods.

Establishing a permanent entrance station.

Specific actions still to be carried out are:

Barrier controls for ORV's.

Increasing information and education contacts with the media and user groups.

Establishing a carrying capacity.

Monitoring and evaluating previous actions.

A second document is the "Angeles Forest Draft Land Management Plan" (1983). The plan provided standards and guidelines for the entire forest as well as prescriptions by areas of specific vegetation types by resource management functions. The preferred alternative for the plan of the Draft Environmental Impact Statement (1983) represents an acceptable mix of prescriptions by area with emphasis on specific functions such as wildlife or recreation. The preferred alternative provided an overall framework within which this study was performed. Direction within this framework relevant to this study concerns the following major subjects:

Riparian Areas
Visual Resources
Recreation Opportunity Spectrum

Wildlife Resources

Recreation Demand

Off-Road Vehicle Use

B. Resource Effects - There is an abundance of literature regarding recreation use effects on resources.

A useful overview of back country impacts is an annotated bibliography by Cole and Schreiner (1981). The following came from this publication. A study of 137 developed campgrounds and picnic areas showed a high level of user effects on vegetation and soils (Magill, 1963). In the Boundary Water Canoe Area, large impacts occurred with light use. This suggests that reduction of use will do little to improve conditions, and shifting use to unimpacted sites will further increase impacts (Frissell, 1965). Observations suggest that established campsites do not continue to deteriorate through time (Magill, 1970). The factor of life zones is related to degree of impacts. Lower life zones showed the greatest amount of change compared to those of higher elevations (Dykema, 1971). A large group even with short camping stays will cause significant impacts (Bogucki, Malanchuk, and Schenck, 1975). A Colorado River study showed that significant determinants of effects are related to the sensitivity of the environment and the nature of the activities. There was no relationship between amount of use and effects (Aitchison, 1976). Another study showed impacts to riparian soils and vegetation to be highly concentrated. However, in contrast to the aforementioned studies, indicating a tendency toward stabilization, riparian impacts tended to spread with time. The author suggests

that managers should attempt to confine the spread. He further notes that most impacts occur rapidly with little use. Impacts are inevitable and vegetation treatment may be necessary (Manning, 1979).

Heinle's off-road trail study (1982) reviewed several publications in regard to off-road vehicle use that are relevant to this study. Compaction of soils reduces potential moisture availability, thus affecting plant growth. The adverse affect on soil characteristics appears to be the heaviest from motorcycle use (Webb, Raglano, Godwin, and Jenkins, 1978) and erosion from vehicle use is especially apparent on steep slopes (Vollmer, 1979).

McCool (1979) stated in his study on visual impacts by off-road vehicles that the following predictions can be made:

1. Four-wheel drive vehicles affect areas three times more quickly than motorcycles.

2. The wet season in some areas is a high impact period.

3. Sandy environments can lose impacts overnight from wind action, while impacts in Pinyon/Juniper environments may last endlessly.

4. Generally, visual effects last longest in extreme environments and are self-mitigating more quickly in more mesic climates.

He further stated that ORV's have become the most controversial wild-land recreation activity in the country.

C. Recreation Use - Motivation, demand, opportunity, capacity and user behavior in regard to recreation use were reviewed.

Will Brown (1982) stated that the pursuit of recreation fulfills a sense of challenge once supplied by occupations. Fulfillment is a regenerative factor necessary to maintain motivation. Motivation in turn is a necessity for the survival of today's culture as we now know it. In this context, managing for quality recreation is extremely important for society.

Cordell (1982) stated that management and use of a recreation base should be assessed in regard to meeting social goals. Crandall (1982) stated that because some 80 percent of all families are nontraditional in structure, the lack of time has become an important factor in recreation. There is a strong trend towards recreation being located closer to home.

In a socio-economic overview of the Forest (Schwabe, 1981), the importance of the Forest in regard to its location was emphasized. Adjacent to the Forest is the population of the Los Angeles Basin of over 9 million people. The Forest is 25 percent of the land base of Los Angeles County and represents 72 percent of committed open space. Population growth for the county is projected at 15 percent by the year 2000. Currently 80 percent of the Forest users are from Los Angeles County, and contribute to 5.5 million recreation visitor days annually. Use is expected to increase 42 percent by the year 2000. It is estimated that 52 percent of recreation use is dispersed activity (outside of developed areas).

Most use occurs on weekends and on less than five percent of the Forest land base (because of topography and vegetation limitations). With most use occurring in high densities in a limited number of areas, the environments are stressed and recreation opportunities are affected.

Los Angeles County is expected to grow faster, economically, than the rest of the nation, and presently ranks 19th among nations of the world. The county enjoys a higher per capita income than the rest of the state or the country. Los Angeles is also a county of minorities with Anglos ranking at 53 percent of the population. Hispanics are expected to eventually become the dominant group.

Wagner (1974) states that because recreation areas produce psychological experiences, acceptable levels of use depend greatly on desired qualities of experience, management patterns, and off-site factors such as alternative opportunities and visitor characteristics. Also, recreational-carrying capacity stems from both a biological or physical concept as well as a social or psychological concept. Physical characteristics of sites define initial durability only.

Stanby (1977) defines carrying capacity as the capacity of a recreation opportunity to produce a specific type or set of experiences. Furthermore, this specified use stems from management objectives which are factors of ecological conditions, public attitudes, existing opportunities and administrative considerations. He states a basic principle that any use produces change. He defines ecological and social

change as undesirable only when it conflicts with management objectives for the areas. The task of management then is to determine how much change is permitted before steps are taken to prevent further change. Therefore, acording to Stanby, capacity is not a fixed value but instead it responds to management.

Thompson (1982) cites research that has shown that the more a site is hardened and developed to handle increased use, the less demand there is by the original users for the newly developed opportunity at that site. As use increases, he stated, user satisfaction also increases but probably with a different group. He continued by stressing the importance of a meticulous evaluation to determine what benefits are being supplied in the existing setting versus benefits from capacity and experience level changes.

Clark, Hendee, and Campbell (1971) make three points concerning values, behavior, and conflict. First, campers and managers have similar goals associated with camping but disagree with activities appropriate to attain those goals. Second, urban-oriented campers show less concern for campground problems versus traditional campground environmental concerns. Third, managers' perception of campers' views is more of a reflection of their own and often is at variance with the campers' sentiments. The authors suspect campers' perspective is a product of an increasing urbanized society and expect a continued urban influence with Forest Service problems. They recommend providing a high development level on the fringes of the forests.

Jacobs (1977) states three implications in outdoor recreation conflicts. First, many conflicts have little to do with recreation. Second, conflict involving recreation has numerous origins including orientation to resources and activities. Third, conflict resolution may not be possible and only may be minimized.

Harris (1979) listed seven factors from which illegal behavior stems. These are: incorrect perceptions, ignorance, boredom, employee behavior, low maintenance standards, and inappropriate site planning.

Schreyer (1982) stated that recreation is a way to fulfill unmet desires from everyday society and recreation activity displays these needs. He further stated that conflicts between user groups reflects different needs required from the same resource.

Crandall (1982) stated that the user while participating in recreation is, for a short time, master of his own life. Therefore, recreation represents freedom.

Stikkers (1983) referenced several points relevant to this study. The act of damaging natural or man-made features reduces potential recreation experiences (Clark, 1976). It can be assumed that vandalism affects the recreation experience of many, if not most, users who have some contact with damaged areas. Another point is that violation of rules and regulations vary by cultural differences (Clark, Hendee, Campbell, 1971). A third point is that damage from group

activity is incidental to the purpose of the gathering (williams, 1976 and Lucas, 1982). Therefore, the more that is known and understood about recreation user groups, the better the chances are for successful management.

D. Management Controls - Managing recreation use and use areas requires various control methods and philosophies. These subjects were explored in the literature search.

Evison (1979) states that social changes in recent years in regard to enforcement has resulted in uncertainty, frustration, controversy, fear and anger. In the National Park Service, this stemmed from such things as a tradition contrary to force, lack of preparation, overreaction, and indifference. Of special note, he states that the image conveyed by any organization is perhaps the most significant factor in the protection of resources, visitors and user experiences. Image is an enormously influential tool. He recommends surrounding visitors with evidence of genuine care for people and resources.

Negative reinforcement is one of four strategies explored in a study that educates, explains, and is supplemented by peer pressure (Burke, Schreyer, and Hunt, 1979). A management application would be a sign reading "Shortcutting can cause soil and plant damage, rock slides, and is illegal".

Utilizing properly trained employees is an important factor in management control. Poor interpersonal skills such as being too busy, emphasis on the big stick over service, or haphazard enforcement contributes to illegal visitor behavior (Harris, 1979). Uniforms play an important role in that they represent authority as well as professional resource management, interpretation, knowledge, and preservation.

Furthermore, the first impression in the form of a neat appearance and friendly eye contact helps establish the ranger image versus the policeman image. All employees who experience public contact should have the same goal of being the kindly authoritarian who offers benefits (Moorehead, 1979).

By concentrating on public service, the California Department of Parks and Recreation, Santa Monica Mountains, has been able to maintain the ranger image (Stikkers, 1983). This is in spite of the fact that all rangers are certified peace officers and several have trained dogs for assistance.

A subtle difference in viewing the role of management in recreation can make a major difference in the quality of the recreation experience and the amount of management problems. Enhancing the experience of the user while maintaining a quality environment should be the emphasis, rather than protecting the environment from the user (Schreyer, 1980).

A study that explored subtle or light-handed techniques as an aid to managing dispersed recreation use (Gregg, 1982) stresses positive, inexpensive, innovative, and simple methods. Two examples include using use symbol signs at trail splits and using narrow bridges not suitable for snowmobiles on ski trails.

Gaining complete compliance on some special use permits can be an exasperating ordeal. The Pennsylvaina State Parks System successfully dealt with this perenial problem with built-in minor penalties in all permits (Forrey, 1982).

There is a commulative effect on recreation experiences from over-regulation. When regulation is perceived as unnecessary by the user, management problems will most likely arise (Williams, 1976 and Lucas, 1982, referenced by Stikkers, 1983).

Access, more than any other factor, is the principal determinant in areas where human effects on the environment occur (Ditton, 1977, referenced by Thompson, 1982). The California Department of Parks and Recreation emphasize controlled access in the Santa Monica Mountains. Furthermore, controlled access has been one of the contributing factors in the success of managing a campground on the Angeles National Forest that was previously plagued with major problems (Stikkers, 1983).

E. Design Criteria - Providing appropriate designs, materials, quantities and locations are major factors in dealing with vandalism.

Research has shown that in back country camping, convenience was an important determinant of site selection. Looking for dispersed sites away from established trails involved a risk that most visitors did not wish to take (Canon, Alder, and Leonard, 1979).

In general, the population of the nation is older, with some segments having more free time and a preference for developed facilities. Also, the switch to smaller cars has created a trend toward tent trailers (Crandall, 1982).

Many management problems stemmed from improper and outdated site planning and activity analysis. Unclear boundaries between recreation activities leads to territory claiming and incompatible recreation activities. Poor trail locations lead to loss of vegetation and erosion. Lack of access for the handicapped causes inconvenience and possibly exclusion. Underestimated type and amount of use can lead to overtaxing facilities and environments. Therefore, it is imperative to have definite development standards and a thorough site analysis (Harris, 1979).

One study explored a practical approach to vandalism. It recommended the acceptance of the reality of vandalism. Adjusting to the realities would minimize impacts. A practical attitude is necessary to provide cost effective planning and management (Bradly, 1981.). An evaluation and recommendation of Littlerock Canyon from the Sheriff's Department for Los Angeles County stated the need for a complete redesign of the

campgrounds (Ott, 1980). This would mean developing designs appropriate to the site conditions, to the type of camping activity and to the type of user.

Off-road vehicle trail planning studies (Paine, 1972, referenced by Heinle, 1982) have developed a list of desirable site characteristics and purposes. They are as follows:

Popularity of the area
Access to the area
Sense of remoteness
Scenic appeal or value
Sufficient number of trails available
Loop trails
Opportunity for cross-country travel
Resource impacts minimized

Comments and recommendations on motorcycle trail standards were developed on the Angeles National Forest. The information provides some excellent guidance (USDA, 1982).

Stikkers (1983) discusses successful vandal-resistant facilities.

CHAPTER III

PROCEDURES

This study concerns management of recreation related activities within Littlerock Canyon of the Angeles National Forest. Over the years, the occurrence of vandalism, disorderly conduct, recreation user conflict, resource damage, and congestion have developed into major problems. It is the purpose of this study to recommend the resolution of the situation by developing a recreation management plan. This chapter details procedures for gathering and analyzing information that will lead to such a plan.

A. Information Gathering

The gathering of information consists of the literature search and the collection of inventory data.

1. The literature search was organized into two subcategories of information applicable to Littlerock Canyon. These are management goals and the collection of basic management concepts and techniques.

    a. The management goals consisted of existing or pending plans that are or have the potential of affecting the management of Littlerock Canyon.

b. Basic concepts and techniques involved the gathering of information that concerns resource efforts, recreation use, management controls and design criteria.

2. Inventory data collection consisted of conducting inventories and gathering material on use areas, use data and resource data.

a. A physical inventory of recreation use areas was conducted from the dam to the Little Cedars Campground area. The inventory involved parking and recreation use areas for both developed and dispersed use. The lack of level sites, as well as limited parking and access, centered the inventory mainly around existing use areas. These areas were inventoried by location, rough site description, use activities, and estimated use capacities (see table 1, p. 31).

b. Use data involved gathering Recreation Information Management (RIM) figures and conducting interviews with field personnel who worked in the Canyon.

1) RIM figures provided annual use amounts and the percent theoretical capacity (occupancy rates for use season) for developed sites within the Canyon.

2) Interviews with field personnel who worked in the Canyon provided information based on experience and professional judgment. The following topics were covered:

a) Estimated patterns of use throughout the year

b) Estimated use by weekday to weekend ratio

c) Type of use by area

d) Conflicts

e) Successes

f) Staffing needs

g) Estimated average number of people per vehicle

h) Locations of activities

c. A resource overview was conducted by specialists concerning the Littlerock Canyon area. Specific resources involved were: soils, hydrology, wildlife, vegetation, and archaeology.

B. Analysis

The analysis consisted of three major categories which involved the following evaluations:

- Basic concepts and techniques from the literature search
- Collected information and data relating to Littlerock Canyon
- Compiled and formulated data applied to specified recommendations
- Recommendations that meet study objectives
- Recommendations evaluated for benefits and costs

1. Relevant information and data gathered for the study were organized and evaluated in five subcategories. The subcategories were based on critical comparisons which would help formulate recommendations.

a. Activity compatibility comparisons were made of recreation activities that have traditionally taken place in the Little-rock Canyon (see figure 4, p. 43). These activities are:

   Driving for pleasure

   Lake fishing

   Stream fishing

   Camping

   Picnicking

   Sunbathing

   Water play

   Resort use

   Off-road vehicle (ORV) - open area use

   Off-road vehicle (ORV) - trail use

b. Comparisons of use densities in Prescription (planning) Area by ROS (Recreation Opportunity Spectrum) Class (see chapter IV).

c. The adequacy of activity facilities such as parking availability was evaluated (see chapter IV).

d. Comparisons of campground development scale to ROS Class development scales for consistency and appropriateness were made (see chapter IV).

e. Seasonal, weekly and daily use was charted to evaluate when use was occurring, to help formulate budgeting and staffing needs (see appendix D).

2. Appropriate basic concepts and techniques derived from the literature search were developed to formulate recommendations to meet the study objectives.

3. Accumulated information and data were analyzed to provide specific recommendations set out at the beginning of this study. The specified recommendations are:

   a. Recreation opportunities to be emphasized
   b. Locations of recreation activities
   c. Use capacities
   d. Design criteria for recreation facilities
   e. Coordinated management controls
   f. Operation schedules
   g. Staffing criteria

CHAPTER IV

ANALYSIS OF DATA

This Chapter, analysis of data, consists of three sections:

Literature Search Material

Inventory Data

Findings and Evaluations

A. Literature Search Material

Management goals and basic concepts and techniques compiled from the literature search are summarized in chapter II.

1. Detailed management goals in the form of Forest-wide standards and guidelines, as well as specific area management prescriptions for Littlerock Canyon, are located in the "Proposed Angeles National Forest Land and Resource Management Plan" draft. Prescriptions four and eight emphasize recreation management, while prescriptions one, five and fifteen emphasize wildlife management.

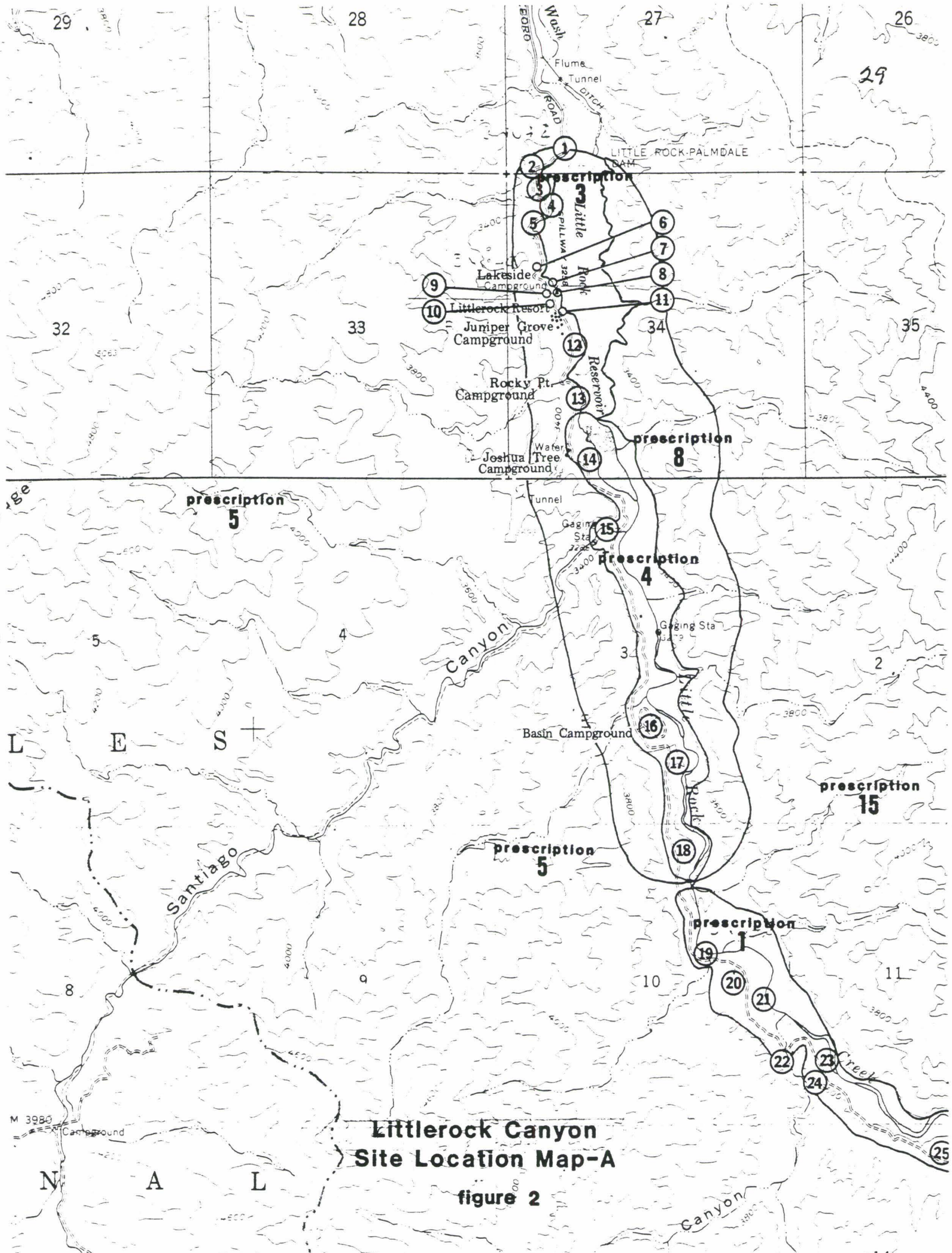
2. Basic concepts and techniques applicable to Littlerock Canyon are described in adequate detail in chapter II.

B. Inventory Data

Inventory data were organized into three categories consisting of physical inventory, use information, and resource inventory.

1. Physical inventory data provide information on site locations within the study area. Figures 2 and 3 (see pp. 29, 30) display site locations, while tables 1 and 2 (see pp. 31-33) list data on each corresponding site.

2. Use information was collected in the form of RIM (Recreation Information Management) data, general interview comments, and incident report warning summaries.
   a. Recreation use by activities for 1982 is displayed in table 3 (see p. 34).
   b. A summary of general interview comments from field personnel consisted of the following:
      1) It is estimated that 95 percent of 2 and 3 wheeled ORV's are not street legal and 25 percent of the operators do not have a driver's license. The situation will conflict with ORV operation on the graded road up canyon. Approximately 65 percent are without spark arrestors.
      2) Of all ORV vehicles, it is estimated that 75 percent are two and three wheelers.
      3) Historically, management has resulted in a large effort on the part of patrolmen with small lasting results. The situation has affected cooperation with the Sheriff's Department.
      4) Historically, dispersed camping has been a management problem in the form of fires, fights, littering, drugs, and irrational behavior. Acceptable recreation has been replaced by unacceptable activity with users seeking freedom from legal constraints. It was felt that 80 percent of the users were a problem. It seems the area has drawn unbalanced people.



Littlerock Canyon
Site Location Map-A

figure 2

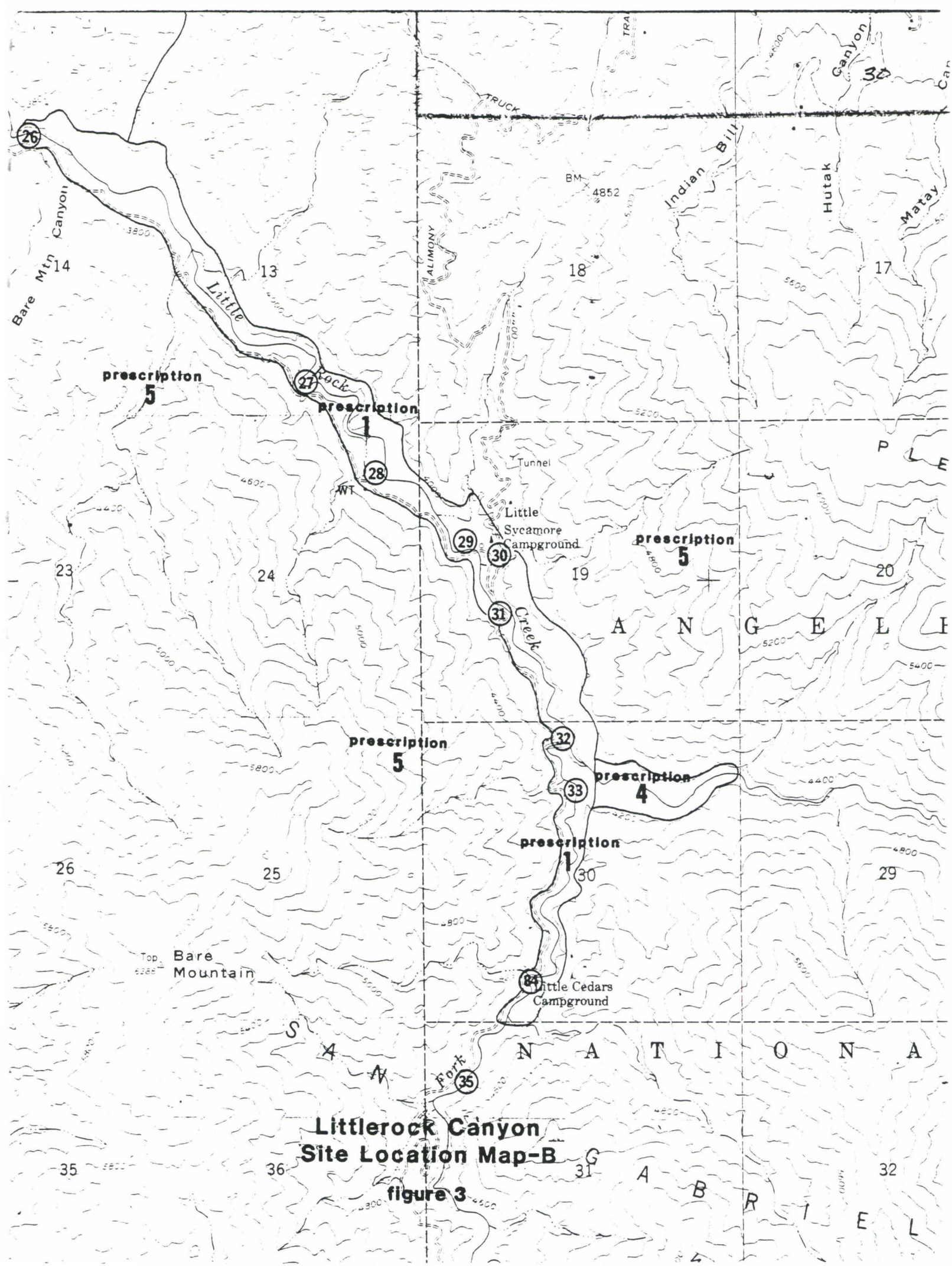

Littlerock Canyon
Site Location Map-B
figure 3
prescription 5
prescription 1
prescription 5
prescription 5
prescription 4
prescription 1
Little Sycamore Campground
Little Cedars Campground
Bare Mountain
Top 6365
Tunnel
Bare Mtn
Canyon
Little
Rock
Creek
Fork
Indian Bill
Hutak
Matay
BM 4852
TRUCK
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TABLE 1 - SITE LOCATION DATA TABLE

Site	Activity	Vehicle Capacity	Visitors Per Vehicle	Est. PAOT	Size	Density	Remarks
1	Observers	4	3	12	0.06	20/A	15 min. Stay
2	Fisherman Parking	5	2	10	0.10	10/A	
3	Swimming Fishing	10	3.5	35	1.00	35/A	Problem Area
4	Camping Boat Launch Picnicking Observers	3	3.0	9	0.06	150/A	15 min. Stay
5	Fishing Picnicking Overflow camping	30	3.5	105	0.50	210/A	Paved Parking Toilets
6	Fishing	2	2	4	0.06	67/A	Parking Spot
7	Camping	6	5	30	1.00	30/A	Developed Campgrd Camping-Pic conflict
8	Fishing Picnicking	8	2	16	0.11	145/A	Conflict w/campgrd Parking lot.
9	Temp Parking	3	3	9	0.06	150/A	Temp Parking 10 mim. Stay
10	Day Use	1	2	2	0.06	33/A	Parking
11a	Resort Parking	15	3	30	0.17	176/A	Congestion
11b	Resort Parking and Day Use	15	4	60	0.17	353/A	
12	Camping	10	5	50	2.00	25/A	Developed Campgrd Providing -Camping ORV Conflicts
13a	ORV Parking Picnicking	40	5	200	0.23	870/A	Parking Area
13b	ORV Picnicking	200	2	400	56.00	7/A	Center of Fishing Picnicking ORV Conflict
14	Camping	11	5	55	2.00	28/A	Developed Campgrd.
15	Picnic ORV	25	4	100	2.00	50/A	ORV-Picnic conflict
16	Camping	24	5	120	7.00	17/A	Developed Campgrd ORV-Camping Picnic conflict
17	Fishing Picnic	3	4	12	0.30	40/A	Water Play
18	Fishing Picnic	20	4	80	1.00	80/A	Swimming Area
19	Fishing Picnic	5	3	15	2.00	8/A	Water Day and Picnic
20	ORV	3	2	6	2.00	3/A	Could barrier off No development

TABLE 1 - SITE LOCATION DATA TABLE CONTINUED

Site	Activity	Vehicle Capacity	Vistors Per Vehicle	Est. PAOT	Size	Density	Remarks
21	Picnic Overnight	30	4	120	3.00	40/A	Kitter Flat
22	General Parking	3	3	9	0.10	90/A	Temp Parking
23	Picnic	2	3	6	0.20	30/A	
24	ORV Climbing Area	---	---	--	--	--	--
25	Picnic	5	4	20	0.10	200/A	Water Play
26	Picnic	3	4	12	0.10	120/A	Water Play
27	Fishing Picnic	3	4	12	0.03	400/A	Water Play
28	Picnic	2	3	6	1.00	6/A	Water Play
29	Picnic	4	3	12	1.00	12/A	Water Play
30	Camping	9	5	45	2.00	23/A	Developed Site
31	Picnic	3	3	9	0.20	45/A	Water Crossing
32	Fishing Picnic	3	3.5	10	0.03	333/A	Drainage Junction
33	Fishing	3	2	6			Fishing Parking
34	Camping	3	5	15	1.00	15/A	Campground
35	Picnic	3	2	6	0.30	20/A	

TABLE 2

SUMMARY OF SITE LOCATIONS BY PRESCRIPTION AREA

Reservoir Area = (Prescription 8)

2	developed campgrounds with	16	units or	80 PAOT
1	resort area with capacity of	30	vehicles or	90 PAOT
10	parking areas with capacity of	106	vehicles or	402 PAOT
13	sites	152	vehicles	572 PAOT

Reservoir to Area 18 (Prescription 4)

1	ORV open area with capacity of	200	vehicles or	400 PAOT
2	developed campgrounds with	35	units or	175 PAOT
3	dispersed parking areas with capacity of	48	vehicles or	192 PAOT
6	sites	283	vehicles	767 PAOT

Area 18 to Little Cedars (Prescription 1)

2	developed campgrounds with	12	units or	60 PAOT
13	dispersed parking areas with capacity of	69	vehicles or	243 PAOT
15	sites	81	vehicles	303 PAOT

Above Little Cedars (Prescription 5)

1	dispersed parking area with capacity of	3	vehicles or	6 PAOT
1	area	3	vehicles	6 PAOT

Totals = 35 Sites	519 Vehicles	1648 PAOT

TABLE 3

REPORTED RIM USE - LITTLEROCK CANYON 1982

Activity	Visits	Visitor Days
Recreation Roads	390,000	32,500
Reservoir	5,400	1,500
Rivers and Streams	27,300	9,100
Campgrounds	66,700	22,000
Resort	12,600	3,300
General Undeveloped	22,600	7,200
Total	524,700	75,600

5) User groups breakdown: 90% Caucasian
5% Hispanic
5% Other

Many visitors are from the San Fernando Valley.

6) User activities historically have been:

ORV operators

Fishermen

Lake Estimated 200-300 PAOT

Stream Estimated 25 PAOT

Water play

Picnicking

Campers

Developed sites

Dispersed sites

Observers and drinkers

Auto touring

7) The periodic presence of the Highway Patrol has reduced accidents.

8) ORV users are starting to hill-climb slopes next to the open area.

9) Approximately 75 percent of ORV's in the open area are parked and involved in observation and group socialization.

10) Field personnel recommendations are:

a) Install a double entrance gate and stop night entries after 9:00 P.M.

b) All dispersed activity to be kept Day Use.

c) Staffing:

Area Directors	1 person
Entrance Station	3 people
Two 2-person Patrols	4 people
Total:	8 people

d) Safety -

(1) Entrance Station - reverse lighting and improved bariers to protect personnel.

(2) Gauging Station is public hazard that has caused the loss of fingers and should be studied.

e) Set use capacities.

f) Enlist the help of ORV clubs to build and maintain ORV trails.

g) Use pavement on all parking areas to help control improvised camping.

h) Provide a boat launching area.

i) Walk-in areas have fewer problems than drive-in sites.

j) The vehicle is a focus of activity and means beer, music and status.

k) Provide fisherman parking areas.

l) Separate ORV use from other use.

m) Eliminate gray areas of decisions.

n) Provide barriers, enforcement and other ORV controls to stop hill climbing.

o) Drive-in dispersed sites need structured environment for compliance.

c. Incident report warning summaries resulting from violations are displayed in table 4 (see p. 38).

3. Resource data were collected concerning soils, hydrology, wildlife, vegetation and archaeology.

a. Soil considerations outlined are:

1) Soil Suitability

a) Shallow, course-textured - highly erodible throughout the study area, especially on steep slopes.

b) River wash behind reservoir suitable for ORV use from a soil standpoint.

c) Trails on slope will require higher than average erosion control and maintenance costs.

2) Soil Specialist Recommendations

a) Keep trail widths narrow - 12-24 inches one way.

b) Maximum sustained grade 8-15 percent if possible.

c) Short steep pitches of 30 percent slope is maximum.

d) No hill climbs.

e) Avoid switch backs.

f) Minimize cuts and fills.

g) Use rolling dip in dealing with drainage.

h) Consider soil puddling in areas with a high water table.

TABLE 4

SUMMARY OF LARGE SAMPLE INCIDENT REPORT WARNINGS
1981 - 1982 LITTLEROCK CANYON

ACTIVITY		PERCENT OF SAMPLE	ASSUMED REASON
Camping			
Illegal Area		.28	Overcrowding, lack of facilities and lack of I&E.
Illegal Fire		.19	
Illegal Parking		.09	
	Total	.56	
ORV Activity			
Illegal Operation		.11	Poor F.S. image, lack of I&E, lack of enforcement and overcrowding.
Unequipped		.07	
Poor Conduct		.06	
No ORV GRN. Sticker		.05	
	Total	.29	
Fee Compliance		.05	Facility condition and design, overcrowding, poor F.S. image and lack of F.S. exposure.
Vandalism		.03	
Poor Conduct, General		.02	
		.03	
Moving Violation		.01	
Hazardous Activity		.01	
	Total	.15	

b. Summary of Hydrology Considerations are as follows:

1) Precipitation

a) 80 percent of the moisture occurs mid-December - mid-March during the off-season.

b) There have been nine major storms since March 1932.

2) Runoff and Peak Flows

a) Peak flows occur on the average of every 30 years.

b) The 1937-38 storm was 85 percent of an estimated 100-year storm.

c) Essentially all Littlerock Canyon use areas, other than the three campgrounds and the resort next to the lake, are in the 100-year floodplain.

3) Water Quality

a) Sedimentation rates are normal for this area.

b) Irrigation district is studying the potential to place excavated silt debris in canyons on the east side of the reservoir (probably where the ORV trail is located).

4) Dam Safety

a) Water level of reservoir may be affected by the dam safety study.

5) Hydrology Specialist Recommendations

a) No major structures in the 100-year flood-prone areas.

b) Portable toilets be kept 60 feet minimum from water because of potential vandalism.

c) Permanent toilets - sealed vaults.

d) ORV trails are major concerns because of sandy, course soils and steep slopes, and will require careful planning.

c. Summary of Wildlife Considerations are as follows:

1) ORV Use

a) Regulate ORV use to capacities.

b) No further expansion of ORV use upstream.

c) Concessionaire-operated open ORV area.

2) Developed Sites

a) No new developed sites.

3) Dispersed Recreation

a) Minimize dispersed use until monitoring can provide quantitative and qualitative terms.

b) Adhere to the forest-wide standards and guidelines.

d. Summary of Vegetation Considerations are as follows:

1) Vegetation Conditions -

a) Vegetation in the Pinyon/Juniper zone is generally holding its own except within and immediately adjacent to campgrounds.

b) Vegetation in the riparian zone is deteriorating, especially in the recreation areas. Natural tree regeneration in these areas is almost nonexistent.

c) Large sycamores are the most important trees in the canyon. Mortality and damage from tree mistletoe is serious.

d) Campfire wood gathering, ORV use, vandalism, and trampling are the major causes of vegetation damage.

2) Vegetation Specialist Recommendations

a) Prune mistletoe out of suitable trees to promote vigor and reduce limb damage.

b) Consider cutting sprouting species such as sycamore, before they die, to take advantage of the sprouts.

c) Plant and maintain suitable vegetation in appropriate locations.

d) Restrict ORV use and foot traffic to designated routes and areas.

e. Archaeological Considerations are as follows:

The one known site (several acres of waste flakes) is located in the 100-year floodplain but is out of the riparian zone. There are several other suspected sites, but they are located above the 100-year floodplain. There may be others.

C. Findings and Evaluations

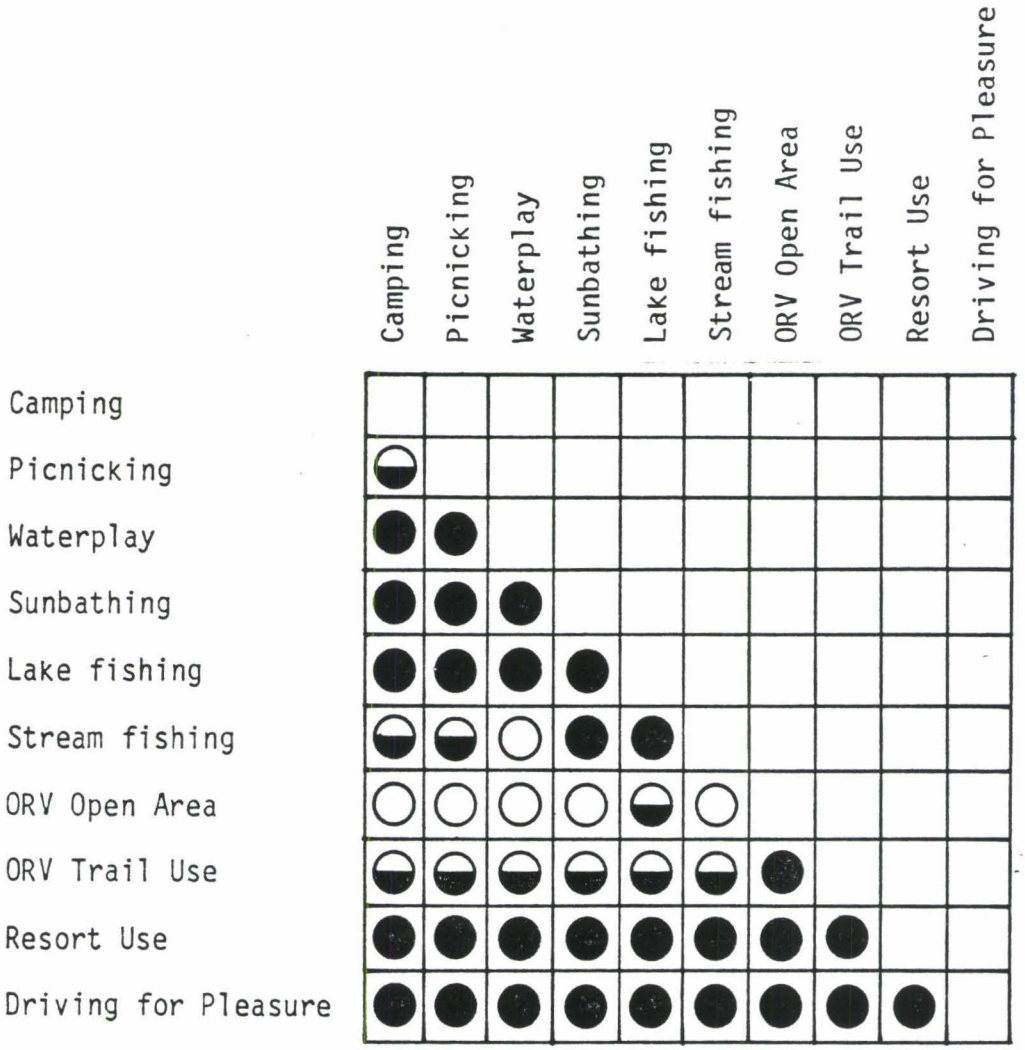
Activity compatibility, use density, and ROS (Recreation Opportunity Spectrum) comparisons, support facilities, campground development scale and ROS classifications, use displays and basic concepts and techniques were evaluated for findings.

1. Recreation activity compatibility is displayed in figure 4 (see p. 43). Summaries of compatibilities are as follows:

   a. The majority of activities taking place in Littlerock Canyon are compatible.
   b. Open ORV use is incompatible with all uses except lake fishing and ORV trail use.
   c. Camping and picnicking generally should be separated.
   d. Stream fishing and water play are incompatible and should be separated.
   e. In comparing compatibility of activities to existing use, it was found that basically, most activities are taking place in various mixes in the same area with little or no separation except in up-canyon locations.

2. Use densities compared to ROS Class (all numbers are within 100 percent capacity) were as follows:

   a. For camping activity (developed) in prescription area four and eight, existing capacity is estimated at 255 PAOT for 12 acres which equals 21.3 PAOT/acre. Rural ROS Class equals 25 to 75 PAOT/acre. Existing density is slightly lower than minimum range of the prescription for the area.
   b. For camping activity (developed) in prescription area one, existing capacity is 60 PAOT for three acres or 20 PAOT/acre for Roaded Natural ROS Class. Existing density is within range of the prescription.



COMPATABILITY OF ACTIVITIES

Figure 3

c. Dispersed use in prescription area four regarding the activities of stream play, fishing and picnicking, the existing capacity estimate is 167 people for 1.9 miles of stream. This use equals 88 people/mile which is well below Rural ROS Class range of density (100-200 PAOT/mile). Dispersed use in prescription area one is estimated at 243 PAOT for 5.7 miles of stream or 42.6 PAOT/mile. This is within the range of Roaded Natural ROS Class of 15 to 100 PAOT/mile.

d. The open ORV area consisting of 56 acres has an existing capacity of 400 PAOT which equals seven people/acre. Assuming that 20 percent of ORV vehicles are in motion at any given time, this equals 1.4 people/acre actively engaged in ORV use. ROS densities range is .64-3 PAOT/acre. Existing capacity is within the range. The remaining 80 percent of ORV users are socially engaged in resting, sunbathing, drinking, observing and playing loud music.

3. Support Facilities Evaluation -

The inventory of support facilities for day use activity (fishing, water play, picnicking, boating) includes the following:

a. Parking areas

b. Two toilets

c. Trash disposal

d. Self-service boat launch

Density for approximately 1 mile of reservoir shore line is estimated at 402 PAOT/mile. At the time of this study, there was no Rural ROS Class for lake shore density. However, facilities suggested for water- based recreation activity exceed what is now provided.

4. Campground Development Scale compared to ROS Class was as follows:
   Lakeside, Juniper Grove and Joshua Tree Campgrounds were inventoried at Recreation Experience Level III.
   Basin Campground inventoried at Experience Level II.
   Rural ROS Class standards show that all these campgrounds should be Level 4 or 5.
   Upper canyon campgrounds (Little Sycamore and Little Cedars) are low III Experience Level. Roaded Natural ROS Class standards are also Level III.

5. Recreation use displays are shown in appendix D (estimated percent full capacity by year, week and day).
   Summaries are as follows:

   Conclusions -

   a. 50 percent or more of capacity occurs March thru September (seven months).
   b. 100 percent or more of capacity occurs May thru July (three months).
   c. During high use periods, 100 percent or more use occurs during Saturday and Sunday. Monday thru Friday use is 50-75 percent of capacity.

d. During low use periods, Saturday and Sunday use is 25-50 percent of capacity. Weekday use is below 25 percent capacity.

e. During high use season, all hours of weekends are 100 percent or more capacity.

f. During high use season, during weekdays from 12 noon to 4 p.m., the area is at 50 percent capacity. All other hours are below 50 percent capacity.

g. During low use period, all hours of weekend use are below 30 percent capacity. The highest use (30 percent) occurs at 2 p.m.

h. During low use periods, all hours of weekday use are below 12 percent capacity.

6. Literature analysis evaluated use displays and basic concepts and techniques regarding resource effects, recreation use, user behavior, management controls and design criteria.

   a. Resource Effects

      1) Management can expect higher costs to maintain resources in Littlerock Canyon than equivalent upper elevation sites. Recreation uses in lower life zones, dry climates, and riparian areas tend to have spreading impacts with slow recovery rates.

      2) Knowing the types and number of ORV's is important in managing resources.

   b. Recreation Use

      1) The awareness of the major contribution that recreation makes toward cultural motivation and the well-being of

society may not be widespread. The use of such knowledge could have a profound and positive effect on land managers' attitude toward public use.

2) The close proximity of Littlerock Canyon to the large population of the Los Angeles Basin will further intensify national trends of the 1980's. Managers will be faced with increased numbers of recreationists with emphasis on week-end use. Since the lack of time will be a major concern for many users, efficiency and simplification in the pursuit of recreation will be important.

3) The limited land base for use areas will continue to be a challenge to land managers. The development and adherence to capacities will be necessary for both the conservation of resources and the maintenance of a quality recreation experience.

4) The potential of high per capita income suggests that many visitors will have technically complex recreation support apparatus that has the potential for environmental impacts (all terrain vehicles). Knowing the characteristics of typical user groups will allow managers to analyze and deal with challenging situations.

5) To effectively deal with user behavior, it is important to correctly understand the highly urban-oriented recreation

user. Factors such as the need for the sense of freedom, different ways to fulfill unmet desires, and some lack of sensitivities and orientation to the environment, must be recognized.

6) Negative behavior can be managed by dealing with numerous factors. These include incorrect perceptions, ignorance, boredom, employee behavior, low maintenance standards, and inappropriate site planning.

7) Conflict resolution will entail preventing different user groups from requiring the same resource. Rationing and zoning of critical activities are possible methods.

c. Management Controls

1) Organization image is a significant management factor involving properly prepared personnel. Interpersonal skills, sharp uniforms, friendly eye contact and emphasis on service will help establish the "ranger" image. Employee orientation toward enhancing the user experience while maintaining the environment will provide a positive emphasis.

2) The use of subtle and indirect techniques (such as access) can reduce the danger of cumulative regulations problems.

d. Design Criteria

1) Providing clear boundaries of activities through proper site planning will reduce user conflicts.

2) Designing to location and estimated type and amount of use will reduce the potential for facility and resource damage.

3) Meet established standards and guidelines for coordination of resources and minimization of conflicts.

CHAPTER V

SUMMARY AND CONCLUSIONS

Recreation activity in Littlerock Canyon of the Angeles National Forest has caused significant management problems. These include vandalism, disorderly conduct, and resource damage. The intent of this study is to focus on problems, recreation activities and recommend appropriate management action.

This Chapter consists of five sections:

Procedures and Findings

Management Alternatives

Conclusions

Discussions and Implications

Recommendations

A. Procedures and Findings

The procedures consist of gathering information from a literature search and area inventory. Information was stated as applicable to Littlerock Canyon.

Data were analyzed through summaries and comparisons. Resultant findings were:

Majority of recreation activity is day use.

Use is exceeding estimated capacities during heavy use periods.

Incompatible recreation activities are occurring in the same place which is causing conflict.

Management problems have developed from the lack of set and regulated capacities.

Developed sites are deteriated and outmoded.

Management control needs are not sufficiently correlated, consistent and positive.

Management image of the Forest Service is very low.

Riparian vegetation has been affected by recreation use.

Late night dispersed activity is contributing to depreciative behavior.

B. Management Alternatives

Five alternatives of varying degrees of management emphasis that address study findings were developed. These ranged from complete unrestricted recreation use to a full closure of Littlerock Canyon to recreation activity. The two extremes representing the least and the most affects of management on recreation were discarded as not being reasonable alternatives.

1. Alternatives Not Considered Reasonable

a. Unrestricted recreation use of Littlerock Canyon would mean foregoing the mission of the Forest Service in providing stewardship of the land. The responsibility for visitor use and safety while protecting the resources cannot be abandoned.

b. Full closure of Littlerock Canyon to recreation use cannot be considered. The historical use of this unique area has created a precedent. Demand for outdoor recreation is strong and growing. The preferred alternative of the Draft Forest Land Management Plan calls for continued recreation use of Littlerock Canyon.

2. Management Alternatives Considered

The three alternatives considered in this plan are based on minimum, moderate and high levels of management emphasis. Evaluation of alternatives was in terms of opportunities, issues and concerns (see p. 4), management direction (see p. 5) and economics (see appendix E, pp. 81-87).

a. Minimum Management Emphasis (historical management perspective before 1980).

1) Minimum management emphasis consists of the following:

a) Unlimited access to Littlerock Canyon.

b) Unlimited use of dispersed recreation areas (including overnight camping).

c) Limited compliance checking for campground fee payment.

d) Limited capacity management for developed campgrounds.

e) Unrestricted mixes of recreation activities.

f) Fire regulations enforced.

g) Operation and maintenance personnel are at a minimum.

2) Evaluation of Minimum Management Emphasis

a) User Safety - Road congestion from overuse and mixing of off-road vehicles with street vehicles would remain. Reckless driving would continue because of crowding, depreciative behavior and the lack of ORV trails. Inadequate facility designs, such as poor line of sight and limited turning radiuses, would most likely remain.

b) Resource Damage to Vegetation and Soil - ORV user abuse, facility overcrowding, outmoded and deteriorated facilities and lack of ORV trails will contribute to continued vegetation and soil loss.

c) Conflicts Between User Groups - Without managing mixes of recreation activities through locations and/or schedules, conflicts between user groups will continue.

d) Depreciative Behavior - Unruly groups, vandalism, intoxication, and criminal activities would continue and most likely increase.

e) Coordination of Management Controls - A limited amount of management coordination would take place.

f) Management Direction - This alternative would not provide a range of recreation opportunities, manage use to the capability and suitability of the land or minimize conflicts between recreation users. Management direction would not be met.

g) Economics - The benefit cost ratio is 3.95 to 1.

b. Moderate Management Emphasis (situation from 1980 through 1982).

1) Moderate management emphasis consists of the following:

a) Establish an entrance station to provide information and education and to create more Forest Service presence.

b) Manage dispersed recreation areas for day use to minimize certain depreciative behavior.

c) Enforce developed campground capacities, to reduce resource losses and user conflicts, as much as facility condition and design will allow.

d) Change use of Rocky Point Campground to an ORV staging area to reduce recreation activity conflicts and resource damage.

e) Increase patrols during high use period for more public contacts and improved enforcement.

f) Fire regulations enforced.

g) Allow overnight camping with self-contained units in designated areas during high use periods to meet overflow needs.

2) Evaluation of Moderate Management Emphasis

a) User Safety - Road congestion from overuse and mixing of ORVs with street vehicles would remain. Reckless driving would be reduced because of increased Forest Service presence

through patrols and the entrance station. Lack of ORV trails still contributes to reckless driving. Inadequate facility designs, such as poor line of sight and limited turning radiuses, would most likely remain.

b) Resource Damage to Vegetation and Soil - ORV user abuse and facility overcrowding would be reduced slightly by increased patrols. However, use of outmoded and deteriorated facilities and lack of ORV trails will contribute to loss of vegetation and soil.

c) Conflicts Between User Groups - Increased patrols will moderately reduce user conflicts. However, without managing mixes of recreation activities through locations and/or schedules, conflicts between user groups will continue.

d) Depreciative Behavior - Unruly groups, vandalism, intoxication and criminal activities would be moderately reduced. The affects of the entrance station, increased patrols, and elimination of overnight dispersed use will contribute to problem reduction.

e) Coordination of Management Controls - Increased management efforts will improve coordination of such programs as signing and Sheriff and Highway Patrol inspections.

f) Management Direction - This alternative would minimally meet management direction. It would reduce some conflicts between users and allow more recreationists to pursue opportunities without intimidation from other users. Developed sites would be managed to some degree of capability and suitability for recreation use.

g) Economics - The benefit cost ratio is 4.08 to 1.

c. High Management Emphasis

1) High management emphasis consists of the following:

a) Establish a permanent entrance station, entrance gate and night exit (one-way directional device).

These facilities would:

- Provide information and education.
- Establish Forest Service presence.
- Enhance opportunities to manage area to a set capacity.
- Reduce depreciative behavior problems and user conflicts.

b) Manage dispersed recreation areas for day use to minimize certain depreciative behavior.

c) Rehabilitate developed campground sites to accomplish the following:

- Meet recommended ROS class densities which would provide for controlled increased use.
- Increase recreation experience levels.
- Facilitate improved campground fee compliance.
- Improve and stabilize site conditions.
- Minimize vandalism and facility deterioration.
- Minimize conflicts between users through well-defined use areas.

d) Zone ORV use to an area which would accomplish the following:

- Minimize conflicts with other users.
- Improve road safety.

e) Establish an ORV trails sytem in the surrounding area to disperse congestion and provide improved and expanded riding opportunities.

f) Establish a training program for all Forest Service officers assigned to Littlerock Canyon which will foster positive public contacts. Emphasis will be on strong leadership that is sensitive to people's needs. The program will result in an improved image of the Forest Service and its officers.

2) Evaluation of High Management Emphasis

a) User Safety - Road congestion from overuse and mixing of ORVs with street vehicles would be minimized. Reckless driving would be reduced because of increased Forest Service presence through patrols and the entrance station and meeting site capacities. ORV trails would disperse use and help defuse potential problems. Facility designs would meet appropriate standards, improving such things as line of sight and turning radiuses.

b) Resource Damage to Vegetation and Soil - ORV user abuse and facility mistreatment would be significantly reduced through increased patrols, developing updated facilities, meeting site capacities, and providing a well designed network of ORV trails.

c) Conflicts Between User Groups - Increased patrols, zoning recreation activity mixes, meeting site capacities, and developing well-defined camping use areas will significantly reduce conflicts between recreation users.

d) Depreciative Behavior - Unruly groups, vandalism, intoxication, and criminal activity would be significantly reduced. The affects of the entrance station, entrance gate with night exit, set hours for day use, meeting site capacities, eliminating overnight dispersed use, developing up-

dated facilities with clearly marked use areas and increased patrols will minimize depreciative behavior.

e) Coordination of Management Controls - Management control coordination would be significantly increased. Efforts in signing, cooperation with other agencies, facility design, personnel training and scheduling, coordinated positive signing, meeting land management planning objectives, and not exceeding site capacities would reinforce all management efforts.

f) Management Direction - This alternative would meet management direction. Combined efforts would provide a range of recreation opportunities, manage use to the capability and suitability of the land and minimize conflicts between users.

g) Economics - The benefit to cost ratio is 3.27 to 1.

3. Preferred Alternative

Based on comparisons of alternatives, using the evaluation criteria (see pp. 4, 5 and 81-87), the High Management Emphasis alternative is recommended as the preferred alternative. Even though the High Management alternative has the lowest benefit cost ratio, it best responds to opportunities, issues and concerns as well as meeting management direction.

TABLE 5 - ALTERNATIVE COMPARISON SUMMARY

Evaluation Criteria	Alternatives by Management Emphasis		
	Minimum	Moderate	High
1. User Safety	Problems Continue	Slightly Reduces problems	Most Reduction of problems
2. Resources	Resource deterioration continues	Resource deterioration slightly reduced	Resource deterioration significantly reduced
3. User Conflict	Conflicts continue	Conflicts moderately reduced	Conflicts significantly reduced
4. Depreciative Behavior	Depreciative Behavior cont. and may increase with time	Depreciative Behavior moderately reduced	Depreciative Behavior significantly reduced
5. Mgmt. Control Coordination	Min. Cont. Coordination	Increase Control Coordination	Significant Control Coordination
6. Mgmt. Direction	Not meeting Direction	Minimally meets Direction	Meets Direction
7. Economics	B/C = 3.95:1	B/C = 4.08:1	B/C = 3.27:1

C. Conclusions

In support of the recommended preferred alternative, based on the findings and within the limitations of this study, conclusions are drawn for specific recommendation topics as outlined under Statement of the Problem in chapter I (see p. 5). These recommendation topics are:

Recreation Opportunities to be Emphasized

Location of Recreation Activities

Use Capacities

Design Criteria for Recreation Support Facilities

Coordinated Management Controls

Operation Schedules

Staffing Criteria

1. Recreation Opportunities to be Emphasized -

Day use recreation opportunities need to be emphasized within the limits of available parking. Specifically, these day use activities include: fishing (lake and stream), water play, picnicking, off-road vehicle use activity (both open area and trail use), and limited sightseeing (driving for pleasure).

Camping needs to be emphasized as a developed site activity without dispersed camping.

2. Location of Recreation Activities -

Day use activities need to be managed in the form of dispersed use throughout the canyon. Open area off-road vehicle use needs to be limited to the canyon bottom area defined as from the ridge south of Rocky Point parking area to Basin Campground. Enforceable barrier controls need to be designed and implemented on the north boundary of

the open ORV area. Staging activities for ORV use should be limited to Santiago Canyon. Basin Campground should continue to access the open ORV area.

ORV trails need to be developed leading from the open area toward Alimony Ridge to the east and up Santiago Canyon to the west. Further study needs to be done to specifically recommend locations of these trails. When implemented, trail use will reduce ORV activity and safety problems on the Littlerock Road.

Overnight camping needs to be confined to developed sites within capacity design standards of the equivalent of one family per unit for existing sites. Updating and meeting ROS class guidelines in future redevelopment will allow for increased capacity and higher density of camping activity. If necessary, multi-family units may be incorporated at that time.

3. Use Capacities -

Use capacity limits need to be exercised through operation controls at the Entrance Station. A capacity of 520 vehicles or 1650 people at one time is the recommended starting point. Observation and monitoring would allow for increasing or decreasing capacities. Specific vehicle entries through the Entrance Station are recommended by activity and location.

Overnight camping activities would be limited to capacity of developed campground facilities. Day use activities would be exercised from 6:00 AM to 9:00 PM through Entrance Station control.

4. Design Criteria for Recreation Support Facilities -

Recreation support facilities need to be upgraded to meet minimum R.O.S. classification guidelines. Vandal-resistant materials need to be

emphasized and incorporated in all areas. Minimum facility development needs should be maintained. Improved safety standards, including line of sight, turning radius and sight distance, need to be incorporated in all developed sites.

There are a number of improvements recommended for the entrance station. In regard to employee safety, night lighting needs to be changed from focusing on the entrance structure to focusing on the entry and exit lanes. Furthermore, indoor locks, tinted glass, speed control and additional barrier protection devices should be incorportated in both directions from the entrance station. Other improvements include one-way directional control device in the exit lane and entrance and exit lane gates.

5. Coordinated Management Controls -

The organizational image needs to be one that emphasizes public service by the expression of concern for people and resources. Personnel dealing with the public need to provide positive, helpful and personable assistance. The preferred law enforcement image is the kindly authoritarian who is in control, but with sensitivity and warmth. Personnel need to be well dressed, neat in appearance and display professional manners. They need to be well trained in dealing with people.

Fee compliance for campsites needs to be emphasized and enforced. All support facilities need to be maintained to high standards of cleanliness and upkeep. Emphasis on a simple, positive correlated and signing needs to be employed in all aspects of management control. Handouts, area maps and other printed matter will be included. Continued efforts in coordination with the California Highway Patrol and Los Angeles County Sheriff's Department need to continue, especially during heavy use periods.

6. Operation Schedules -

Entrance Station operation requires a minimum of three people during high use periods of activity. The high use period is considered to be May through July from Friday afternoons through Sunday evenings. During this period, the entrance station needs 24 hour manning.

A minimum of two patrol units are recommended within the canyon use areas from 8:00 AM to 9:00 PM during May through July.

A facility maintenance crew of 2 people is needed Monday through Friday during the high use period. Saturday or Sunday tours may be necessary to insure good conditions during high use days.

7. Staffing Criteria -

Staffing criteria for operation and maintenance personnel working in Littlerock Canyon are as follows:

Patrol Personnel: Minimum of two people per patrol unit and who are at least Level 2 trained. Experienced employees at GS-5 pay grade. Level 4 personnel may be necessary initially in the program.

Entrance Station: Minimum of three people on weekends and holidays.
Experienced employees at GS-3 or 4 pay grade.

Recreation Crew: Minimum of 2 people, one at GS-4 pay grade.

Area Director: Experienced supervisor with good managerial skills, at the GS-9 pay grade.

D. Discussions and Implications

Through implementation of the foregoing conclusions, the quality of the recreation experience will be increased and user conflicts reduced. Facility changes, upgrading, and improvements should be done through further study and site development plans.

The demand for open fires in dispersed sites is high, while historically there have been no escaped fires. The only problem that has surfaced has been one of policy. This situation needs further evaluation with consideration for allowing open fires in dispersed sites.

Difficult public access along portions of the canyon is beneficial to wildlife because of reduced intrusions into riparian habitat. Additional access and expanded use in the canyon bottom should not take place.

E. Recommendations (What now?)

The preferred alternative management emphasis following the conclusions outlined in this study should be implemented in order to resolve the conflicts and reduce management problems in Littlerock Canyon. Implementation of the preferred alternative in times of decreasing budgets, while recreation use is increasing, will be a difficult management task. Anything done toward total implementation will definitely benefit both the Forest Service and the recreation user.

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APPENDIX A

Prescriptions Area Acreage By Kind of Area

Area Kind	PxW	Px8	Px4	Px1	Total
Lake	93.0	-	-	-	93.0
Parking	-	2.2	3.3	11.9	17.4
Camping (Developed)	-	3.0	9.0	3.0	15.0
Resort (Parking)	-	0.3	-	-	0.3
Stream	-	-	(12,000') 14.0	(30,000') 34.0	(42,000') 48.0
Road	-	(5,500') 4.0	(9,000') 6.0	(27,500') 19.0	(42,000') 29.0
General Land Area	-	542.5	111.7	465.1	1119.3
ORV Play Pen	-	-	56.0	-	56.0
TOTAL	93.0	552.0	200.0	533.0	1378.0

APPENDIX B

Summary of Large Sample Incident Report Warnings 1981-1982 Littlerock Canyon

Compiled by Gary Brogan
From Incident Report Sample 2-18-83

		Incident Sample	Percent Sample	
a.	Camping Outside of Campgrounds	105	.28	
a.	Open or Unattended Fires	72	.19	
a.	Illegal Parking - in Campgrounds or on Roads	35	.09	
b.	ORV Operation - Restricted Areas, Fire Closure, County Roads	35	.09	
b.	No ORV Spark Arrestor or Muffler	25	.07	ORV
c.	Poor Conduct, Disorderly, Crowding, Noise, Nudity	22	.06	1/2 ORV
b.	No State ORV Green Sticker	20	.05	ORV
d.	Failure to Pay Campground Fee	18	.05	
c.	Littering	15	.04	1/2 ORV
b.	Moving Vehicle Violation - Speeding or Failure to Stop	11	.03	2/3 ORV
c.	Vandalism	10	.03	
e.	Hazardous Activity - Shooting or Fireworks	7	.02	1/100 ORV

FOOTNOTES:

a. Overcrowding, lack of facilities, high demand for activity.

b. Lack of enforcement and clear direction.

c. Lack of strong image and enforcement.

d. Outmoded facility designs and lack of enforcement.

e. Lack of enforcement.

APPENDIX C

1982 Littlerock Entrance Station Data

MONTH	NO. OF VEHICLES	NO. OF PEOPLE	NO. OF CAMPERS VEHICLES	ORV	CAMP	DRIVE	FISH	SIGHT SEEING	"DAY USE"	PICNIC	BOAT	SWIM	PARTY
APRIL	3,675	8,785	390	454	982	1,583	814	302	1,593	268	196	409	95
MAY	6,798	18,232	700	1,203	1,888	2,867	1,279	191	8,483	344	171	289	22
JUNE	4,261	11,188	314	885	838	1,500	542	244	6,057	385	161	346	14
JULY	4,603	13,020	463	912	1,916	1,342	405	550	4,732	440	180	2,084	39
AUGUST	2,755	6,217	121	410	378	525	332	527	2,487	267	111	1,174	11
Season TOTAL	22,092	57,442	1,988	3,864	6,002	7,817	3,372	1,814	23,352	1,704	819	4,302	181

1 - Average people per vehicle = 2.6

2 - Average number of camper vehicles = 9% of total vehicles going by Entrance Station.

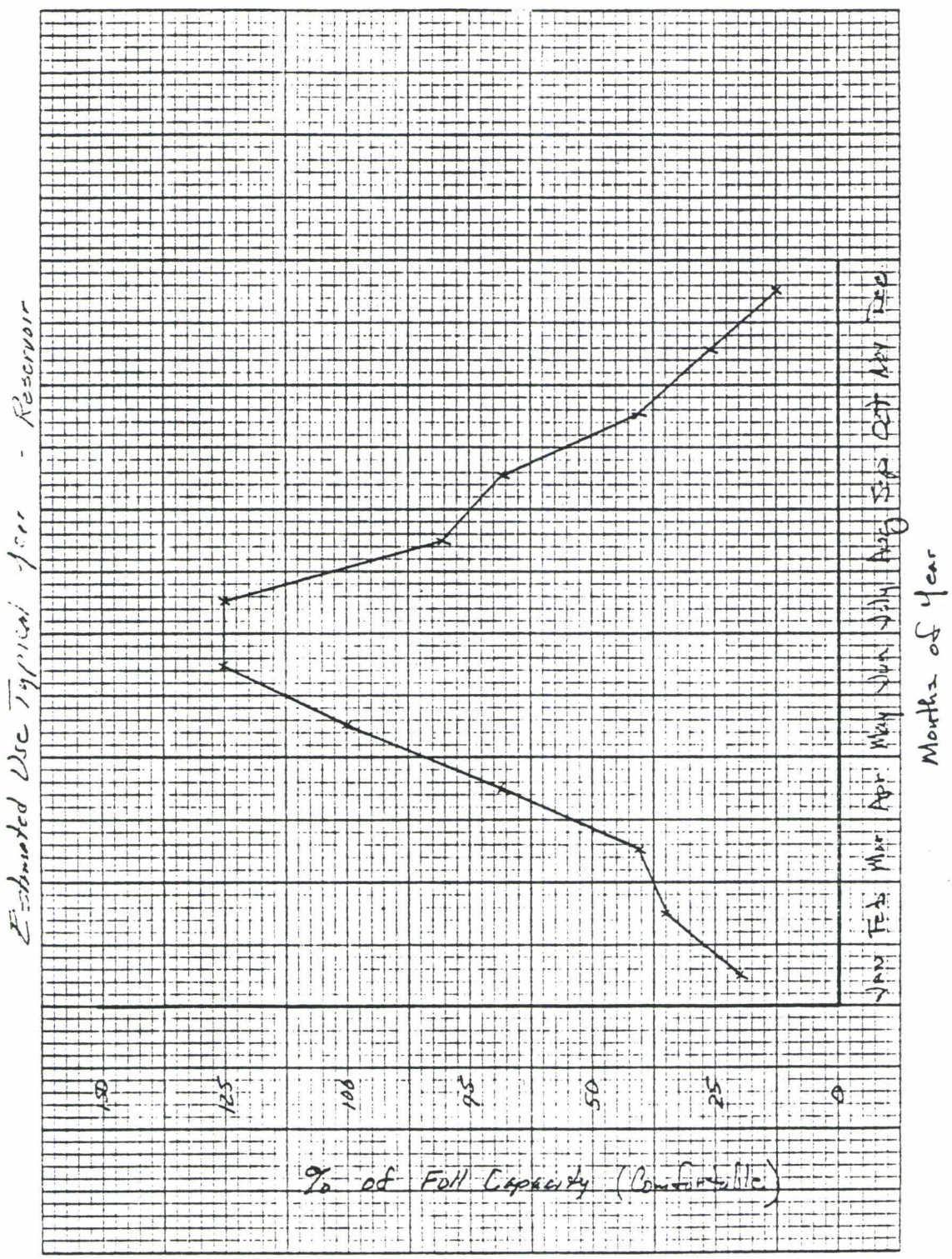
3 - 11.3% of people seeking overnight activity.

4 - 88.7% of people seeking day use activity.

APPENDIX D

Estimated Use on Annual, Weekly and Daily Basis

APPENDIX


Estimated Use Typical Year - Reservoir
% of Full Capacity (Controllable)
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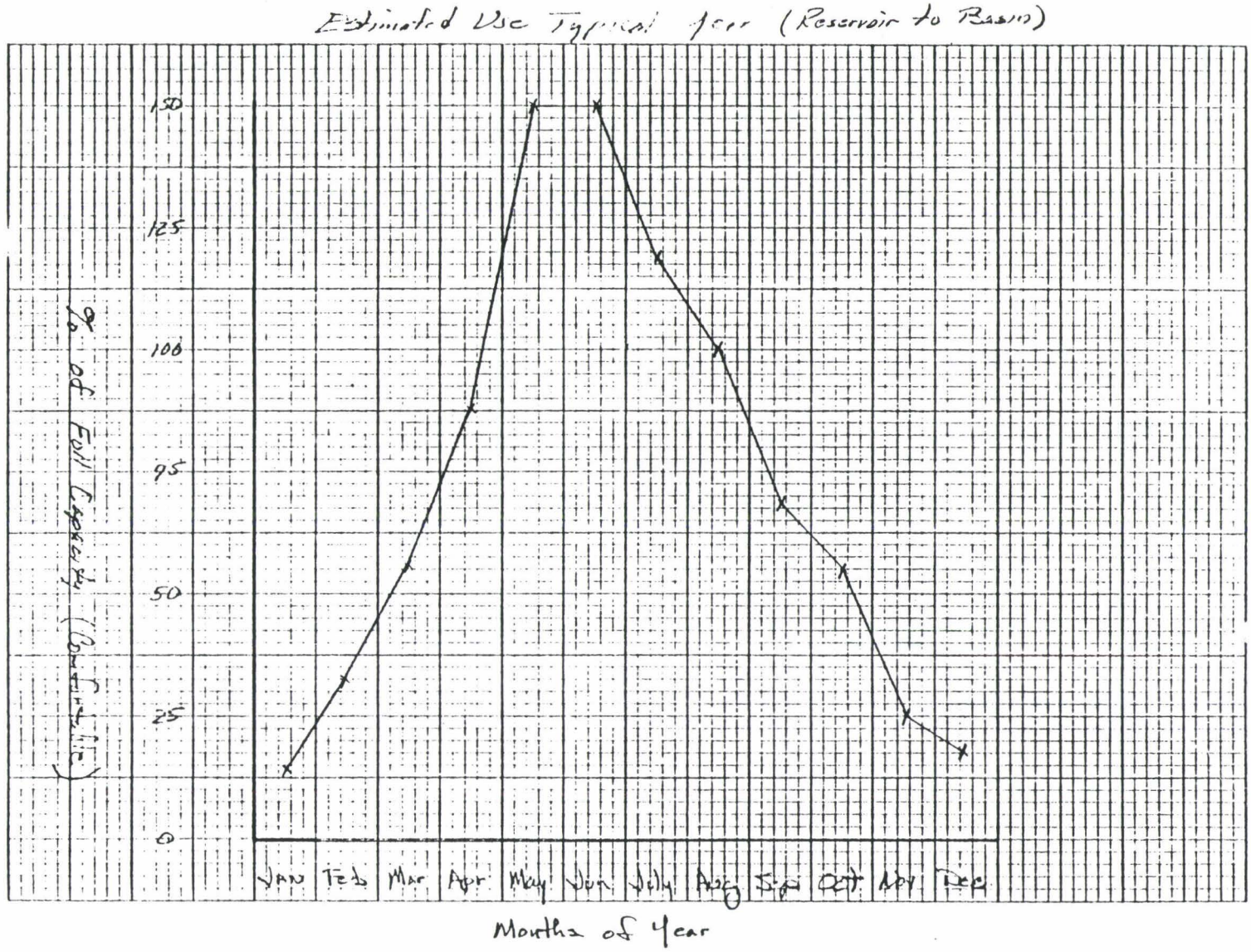
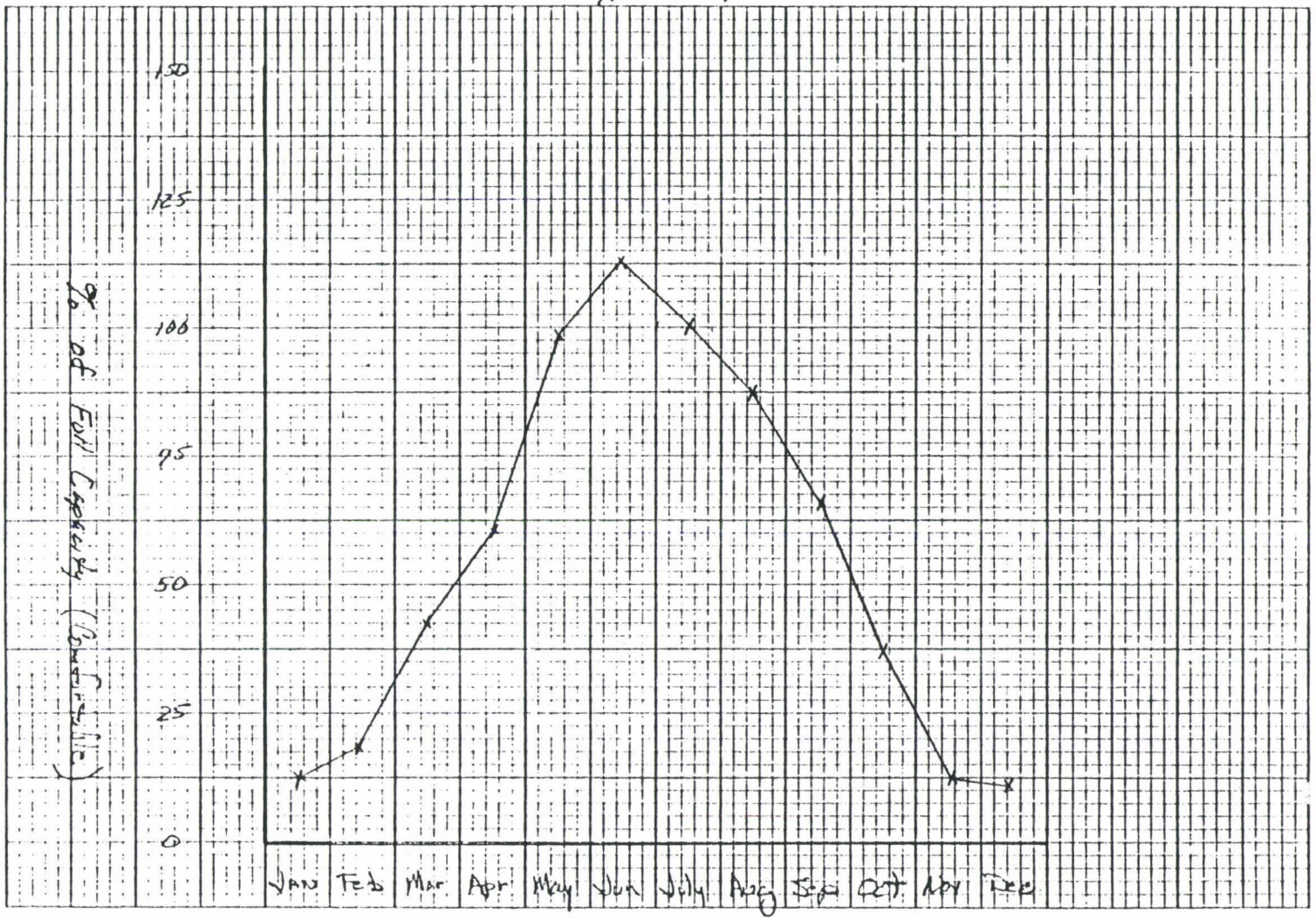
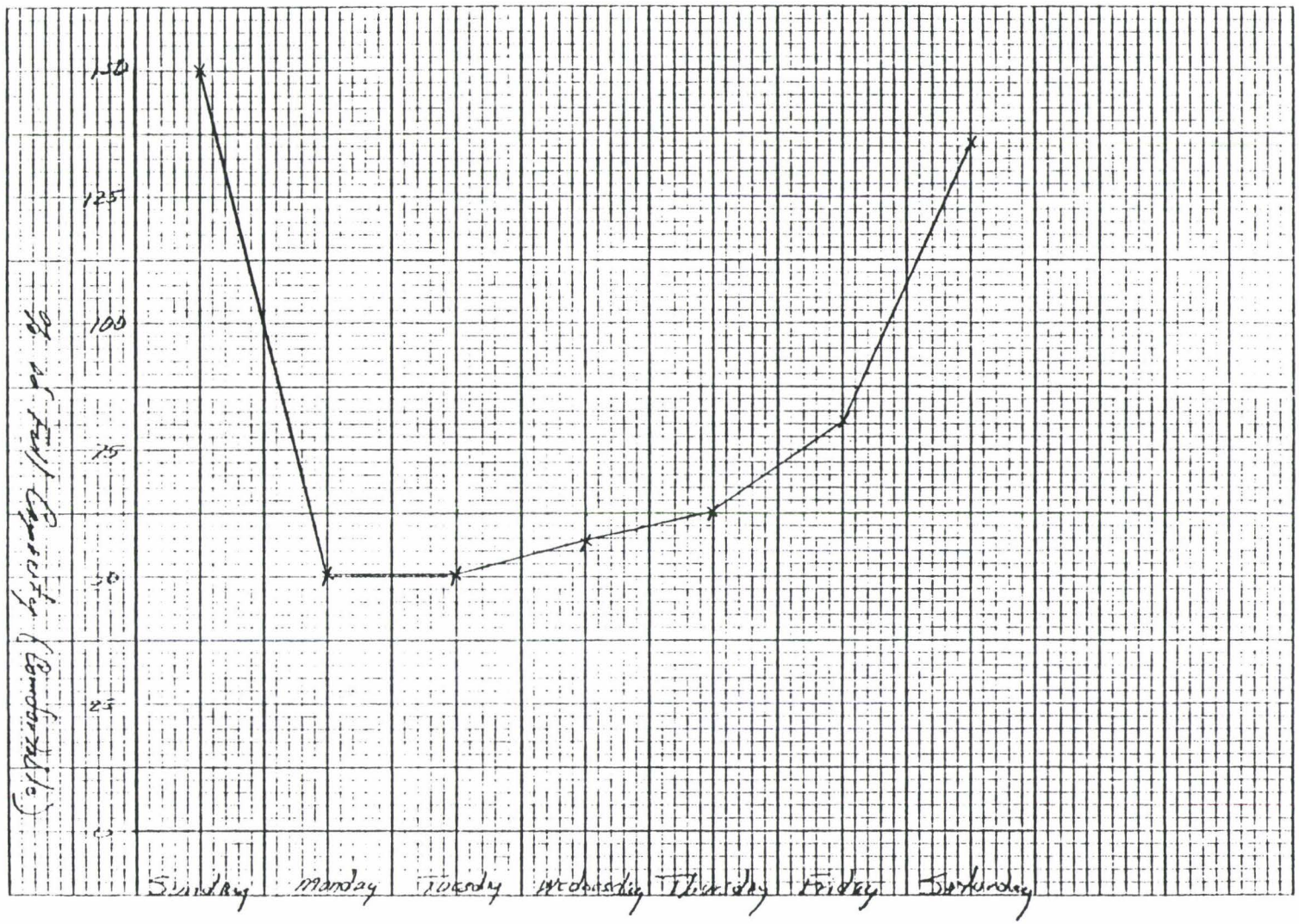
125
100
75
50
25
0
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Months of Year


Estimated Use Typical Year (Reservoir to Basin)
150
125
100
95
50
25
0
JAN
Feb
Mar
Apr
May
Jun
July
Aug
Sept
Oct
Nov
Dec
Months of Year

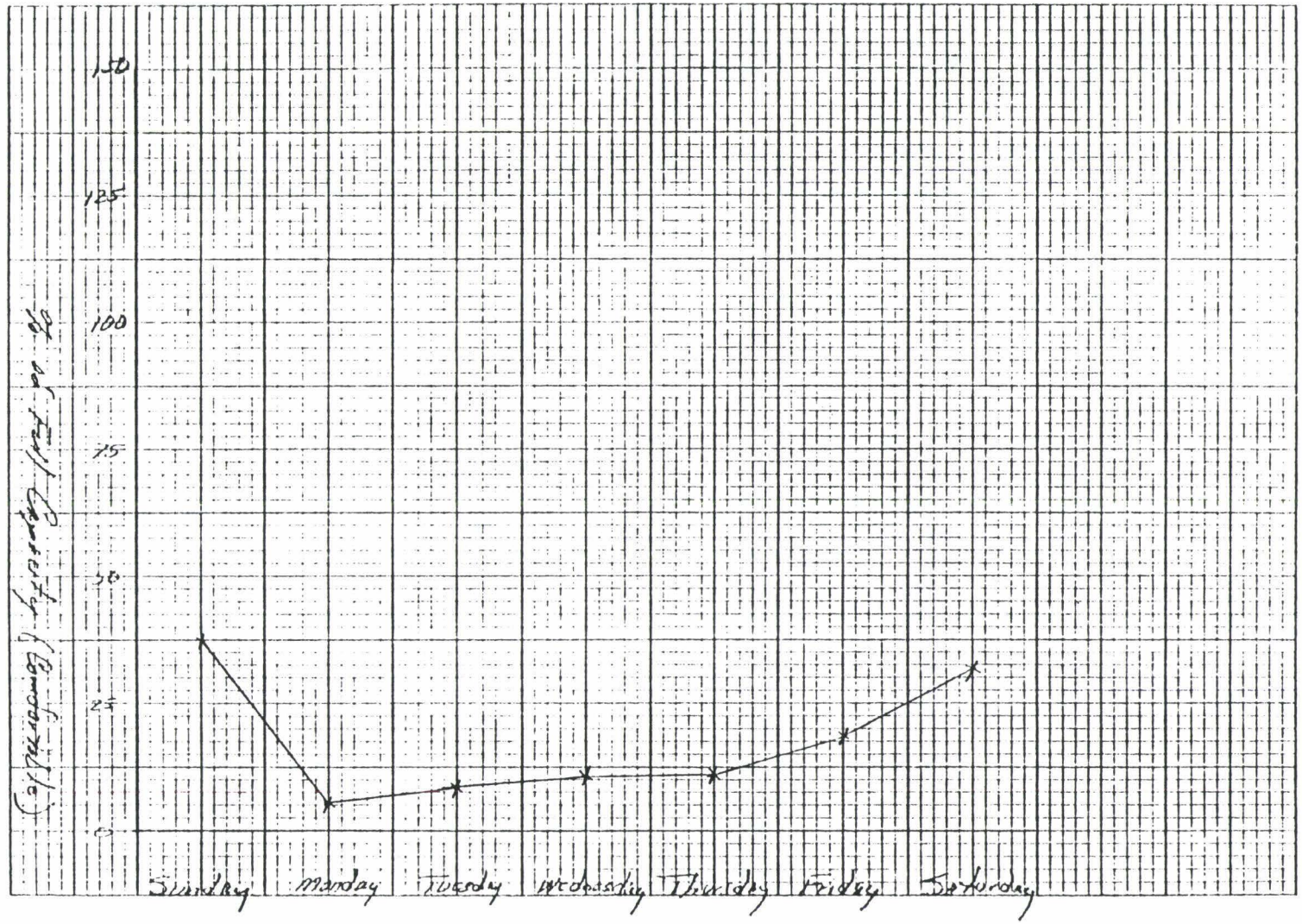
Estimated Use Typical Year (Up Canyon)

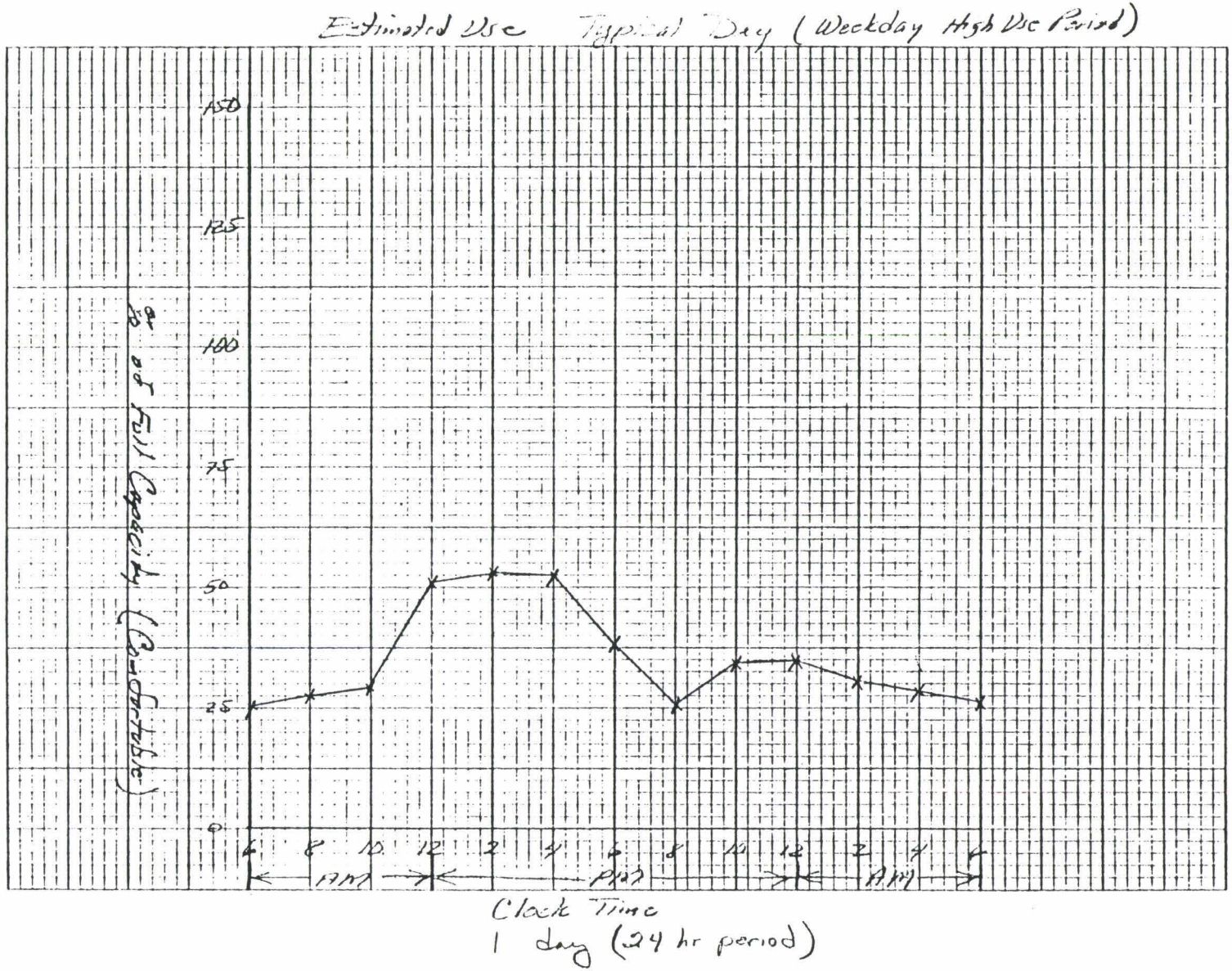


Estimated Use Typical Week - (High Use Period)

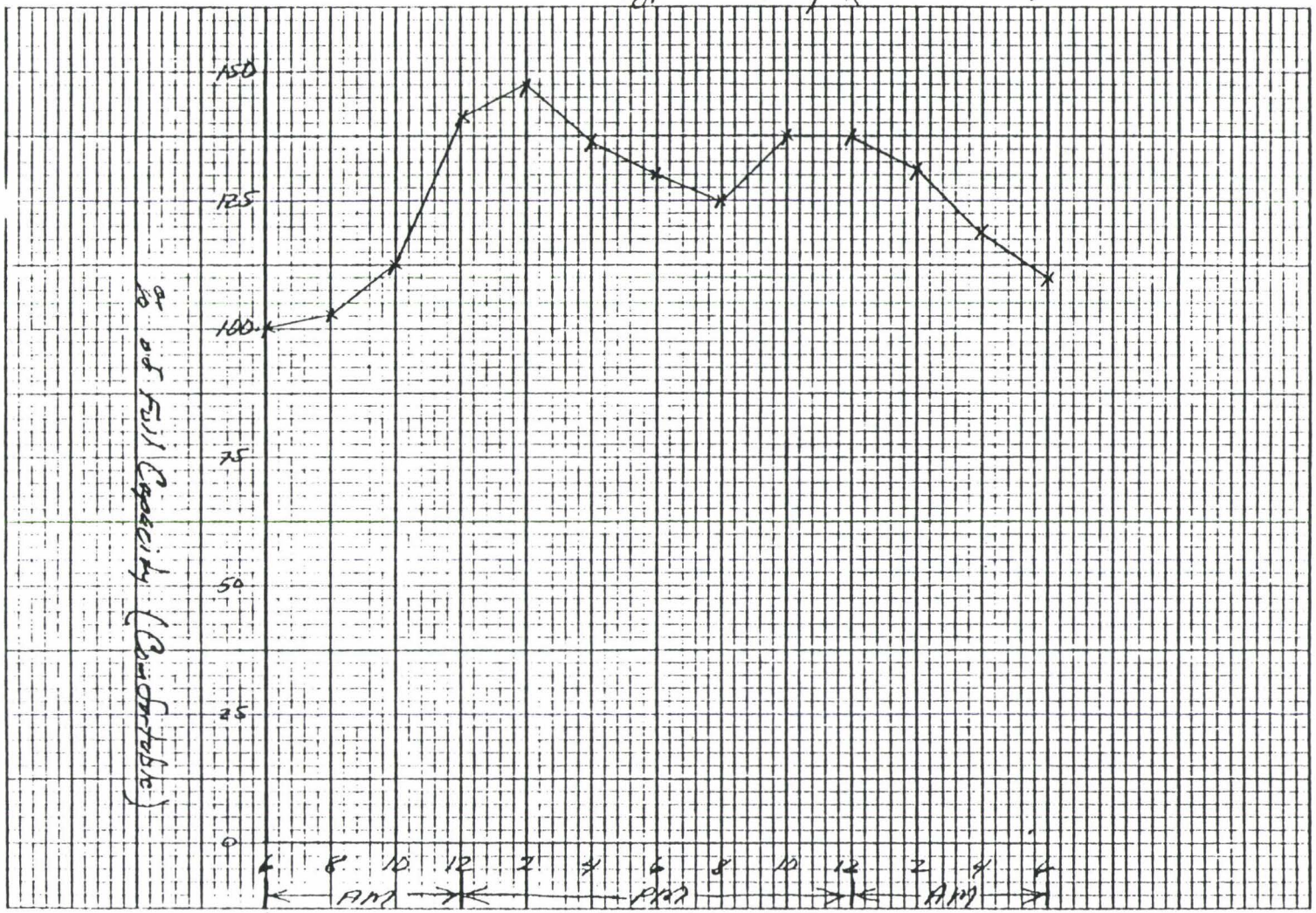


Estimated Use - Typical Week - (Low Use Period)



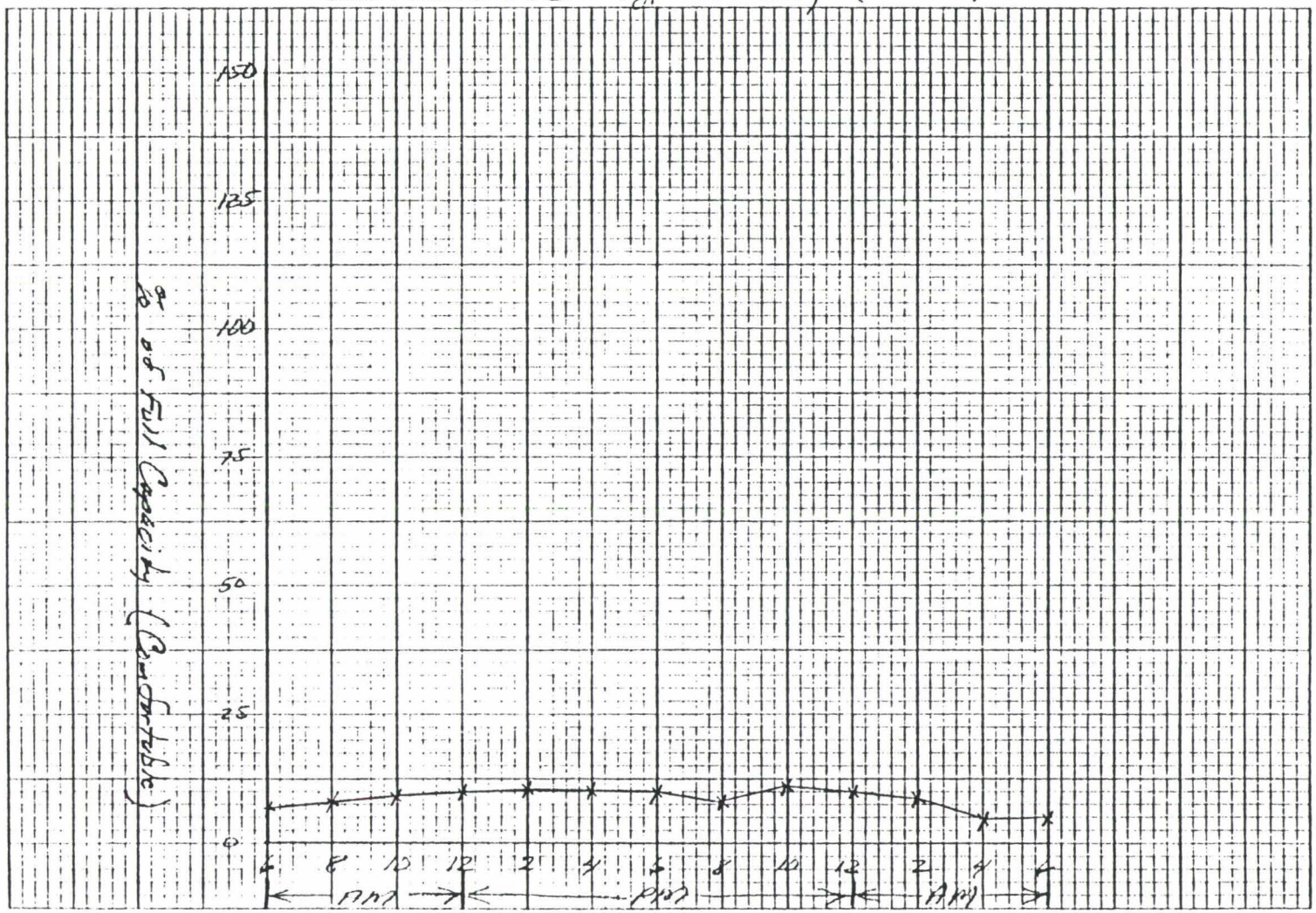

Estimated Use Typical Day (Weekday High Use Period)
150
125
100
75
50
25
0
% of Full Capacity (Controllable)
6
8
10
12
2
4
6
8
10
12
2
4
6
AM
PM
AM
Clock Time
1 day (24 hr period)

Estimated Use Typical Day (Weekend High Use Period)

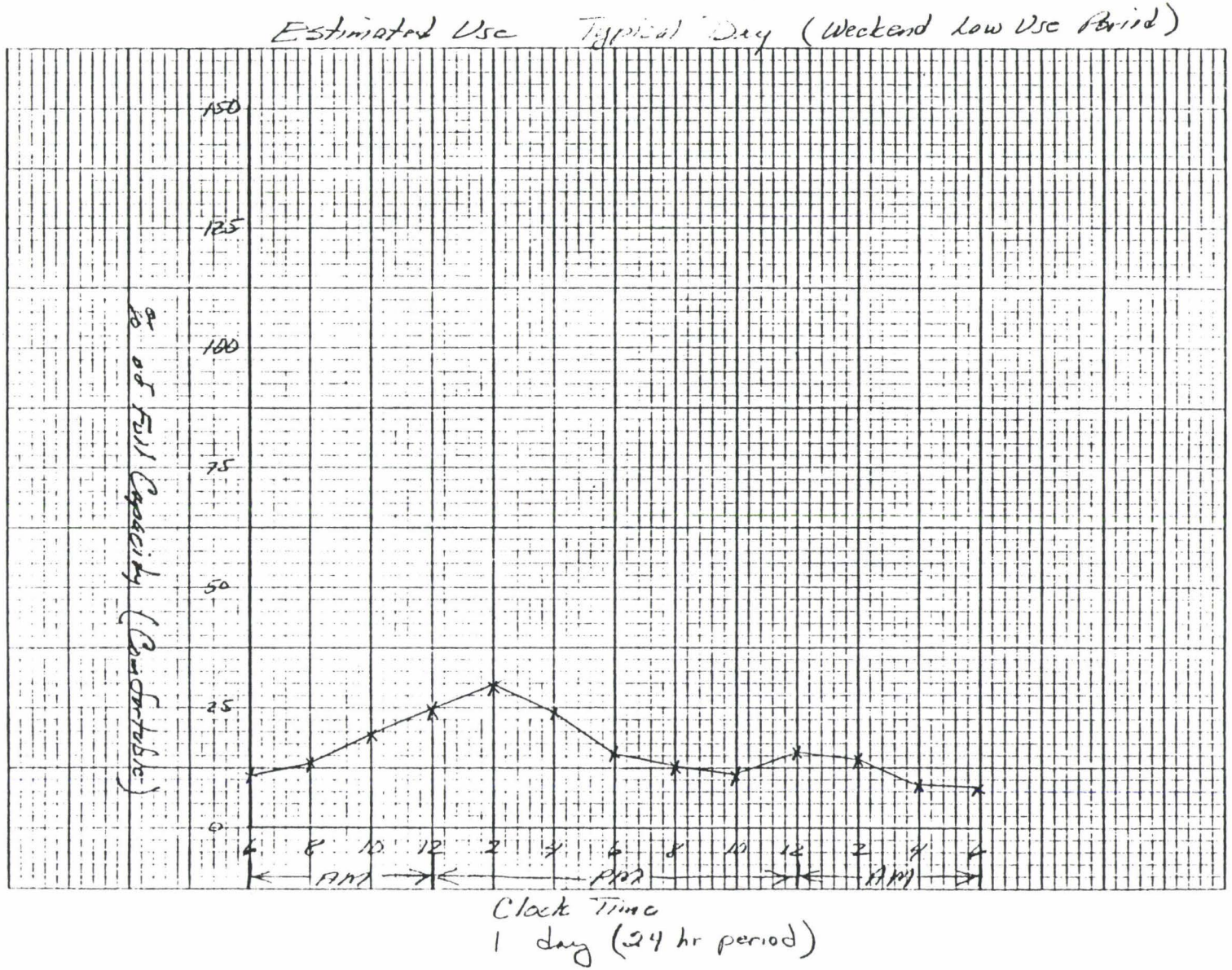


Clock Time
1 day (24 hr period)

Estimated Use Typical Day (Weekday - Low Use Period)



Clock Time
1 day (24 hr period)


Estimated Use Typical Day (Weekend Low Use Period)
150
125
100
75
50
25
0
% of Full Capacity (Pump Output)
6 8 10 12 2 4 6 8 10 12 2 4 6
AM
PM
AM
Clock Time
1 day (24 hr period)

APPENDIX E

Economic Analysis, Littlerock Canyon

ECONOMIC ANALYSIS
LITTLE ROCK CANYON

I. ESTIMATED COST FOR IMPLEMENTATION OF EACH ALTERNATIVE:

Item	Cost By Alternative		
	Minimum	Moderate	High
Area Director - year long	-	$ 29,972.00	$ 29,972.00
Entrance Station - May through Sept	-	$ 20,000.00	$ 35,000.00
Area Patrol Units	$ 43,880.00	$ 43,880.00	$ 62,120.00
Rec. C & P Crew	-	-	$ 21,100.00
Garbage Contract	$ 3,200.00	$ 3,200.00	$ 3,200.00
Level IV Law Enforcement	-	-	$ 20,000.00
Special Equipment	-	$ 3,100.00	$ 8,700.00
Vandalism Costs	$ 10,000.00	$ 3,000.00	$ 1,000.00
TOTAL	$ 57,080.00	$103,152.00	$181,092.00

II. ESTIMATED RECREATION VISITOR DAYS PER YEAR FOR LITTLE ROCK CANYON BY ALTERNATIVE:

Activity	RVD's By Alternative		
	Minimum	Moderate	High
Camping:			
Memorial Day to Labor Day	25,000	26,000	25,110
Other	5,000	6,000	6,320
	30,000	32,000	31,430
Fishing:			
Memorial Day to Labor Day	8,000	9,200	9,174
Other	1,000	1,400	1,324
	9,000	10,600	10,498
Day Use:			
Memorial Day to Labor Day	40,000	37,000	35,283
Other	12,000	10,000	9,300
	52,000	47,000	44,583
TOTAL	92,000	89,600	86,511

III. VALUES:

Values used to calculate benefits are from the R.P.A. 1986 update converted to 1982 dollars.

Camping = $4.17 per Recreation Visitor Day

Day Use = $7.64 per Recreation Visitor Day

Fishing = $21.97 per Recreation Visitor Day

IV. CALCULATIONS:

Yearly costs were taken from chart totals in item I. above for each alternative.

Benefits were calculated by multiplying activity recreation visitor days by R.P.A. (1982 dollar) values and totaling for each alternative.

Present Value calculations were calculated using the Present Value equation:

$$Vo = \frac{Vn}{(1+i)^n}$$

Vo = Present Value
Vn = Value in year n
i = Interest rate
n = Number of years

All costs and benefits were discounted to their present values for a period of 20 years using a 4% interest rate. Tables follow showing these calculations for each alternative.

V. CASH FLOW SCHEDULE FOR EACH ALTERNATIVE:

PRESENT VALUE CALCULATIONS
MINIMUM MANAGEMENT ALTERNATIVE

Year	Discount Factor 4%	Costs	P.V. Costs	Benefits	P.V. Benefits
1	1.04	$ 57,080	$ 54,885	$ 720,110	$ 692,413
2	1.08	57,000	52,778	720,110	666,769
3	1.12	460,000	410,714	657,560	587,107
4	1.17	57,000	48,718	720,110	615,479
5	1.22	57,000	46,721	720,110	590,254
6	1.27	460,000	362,205	657,560	517,764
7	1.32	57,000	43,182	720,110	545,538
8	1.37	57,000	41,606	720,110	525,628
9	1.42	460,000	323,944	657,560	463,070
10	1.48	57,000	38,514	720,110	486,561
11	1.54	57,000	37,013	720,110	467,604
12	1.60	460,000	287,500	657,560	410,975
13	1.67	57,000	34,132	720,110	431,204
14	1.73	57,000	32,948	720,110	416,249
15	1.80	460,000	255,556	657,560	365,311
16	1.87	57,000	30,481	720,110	385,086
17	1.95	57,000	29,231	720,110	369,287
18	2.03	460,000	226,601	657,560	323,921
19	2.11	57,000	27,014	720,110	341,284
20	2.19	57,000	26,027	720,110	328,817
TOTAL			$2,409,770		$9,530,321

Note: Every three years, 50% of all developed sites were figured to be rehabilitated at a cost of $13,000.00 per unit.

B/C ratio = 3.95/1

PRESENT VALUE CALCULATIONS
MODERATE MANAGEMENT ALTERNATIVE

Year	Discount Factor 4%	Costs	P.V. Costs	Benefits	P.V. Benefits
1	1.04	$ 103,152	$ 99,185	$ 725,402	$ 697,502
2	1.08	100,000	92,593	725,400	671,667
3	1.12	100,000	89,286	725,400	647,679
4	1.17	100,000	85,470	725,400	620,000
5	1.22	503,000	412,295	658,682	539,903
6	1.27	100,000	78,740	725,400	571,181
7	1.32	100,000	75,758	725,400	549,545
8	1.37	100,000	72,993	725,400	529,489
9	1.42	100,000	70,423	725,400	510,845
10	1.48	503,000	339,865	658,682	445,055
11	1.54	100,000	64,935	725,400	471,039
12	1.60	100,000	62,500	725,400	453,375
13	1.67	100,000	59,880	725,400	434,371
14	1.73	100,000	57,803	725,400	419,306
15	1.80	503,000	279,444	658,682	365,934
16	1.87	100,000	53,476	725,400	387,914
17	1.95	100,000	51,282	725,400	372,000
18	2.03	100,000	49,261	725,400	357,340
19	2.11	100,000	47,393	725,400	343,791
20	2.19	503,000	229,680	658,682	300,768
TOTAL			$2,372,262		$9,688,704

Note: Every five years, 50% of all developed sites were figured to be rehabilitated at a cost of $13,000.00 per unit.

B/C ratio = 4.08/1

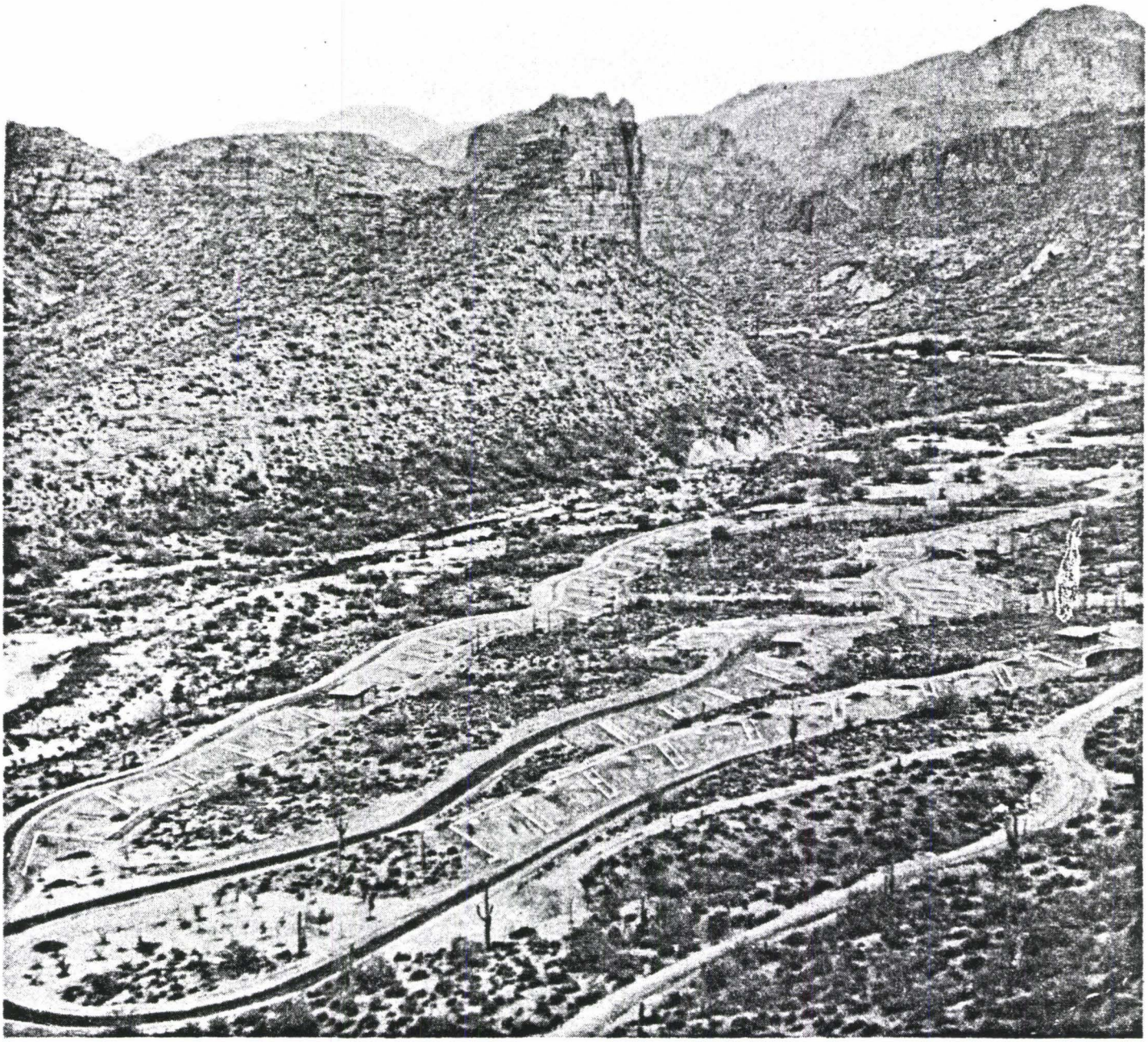
PRESENT VALUE CALCULATIONS
HIGH MANAGEMENT ALTERNATIVE

Year	Discount Factor 4%	Costs	P.V. Costs	Benefits	P. V. Benefits
1	1.04	$ 181,092	$ 174,217	$ 702,318	$ 675,306
2	1.08	172,300	159,537	702,318	650,294
3	1.12	172,300	153,839	702,318	627,070
4	1.17	172,300	147,265	702,318	600,272
5	1.22	172,300	141,230	702,318	575,670
6	1.27	172,300	135,669	702,318	553,006
7	1.32	575,300	435,833	636,786	482,414
8	1.37	172,300	125,766	702,318	512,641
9	1.42	172,300	121,338	702,318	494,590
10	1.48	172,300	116,419	702,318	474,539
11	1.54	172,300	111,883	702,318	456,051
12	1.60	172,300	107,688	702,318	438,949
13	1.67	172,300	103,174	702,318	420,550
14	1.73	575,300	332,543	636,786	368,084
15	1.80	172,300	95,722	702,318	390,177
16	1.87	172,300	92,139	702,318	375,571
17	1.95	172,300	88,359	702,318	360,163
18	2.03	172,300	84,877	702,318	345,969
19	2.11	172,300	81,659	702,318	332,852
20	2.19	172,300	78,676	702,318	320,693
TOTAL			$2,887,743		$9,454,861

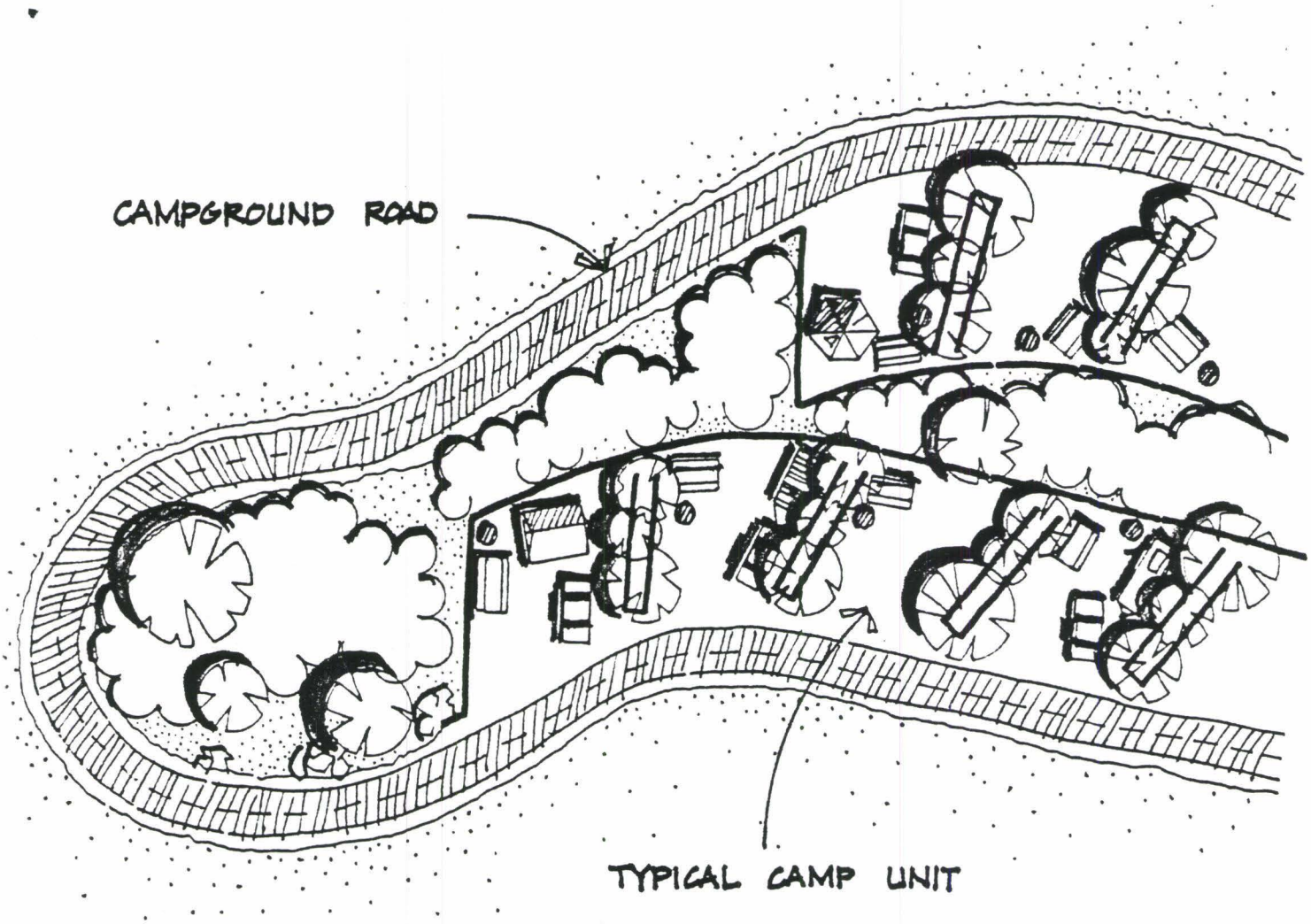
Note: Every seven years, 50% of all developed sites were figured to be rehabilitated at a cost of $13,000.00 per unit.

B/C ratio = 3.27/1

APPENDIX F

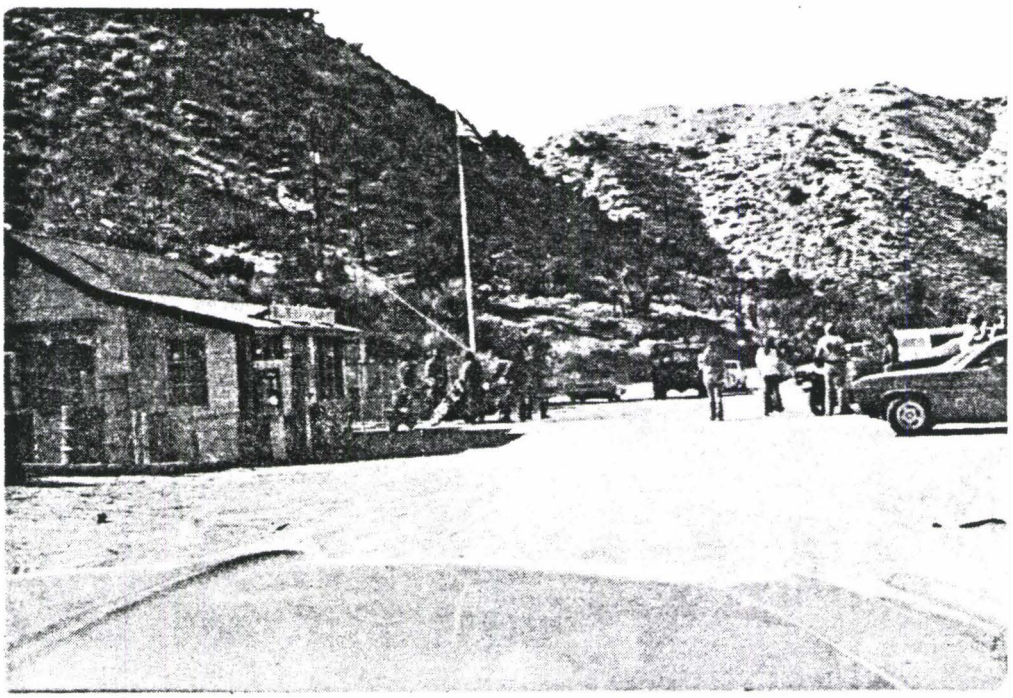


Example of a high density campground on a hillside location (Tortilla Flat Campground, Tonto National Forest).

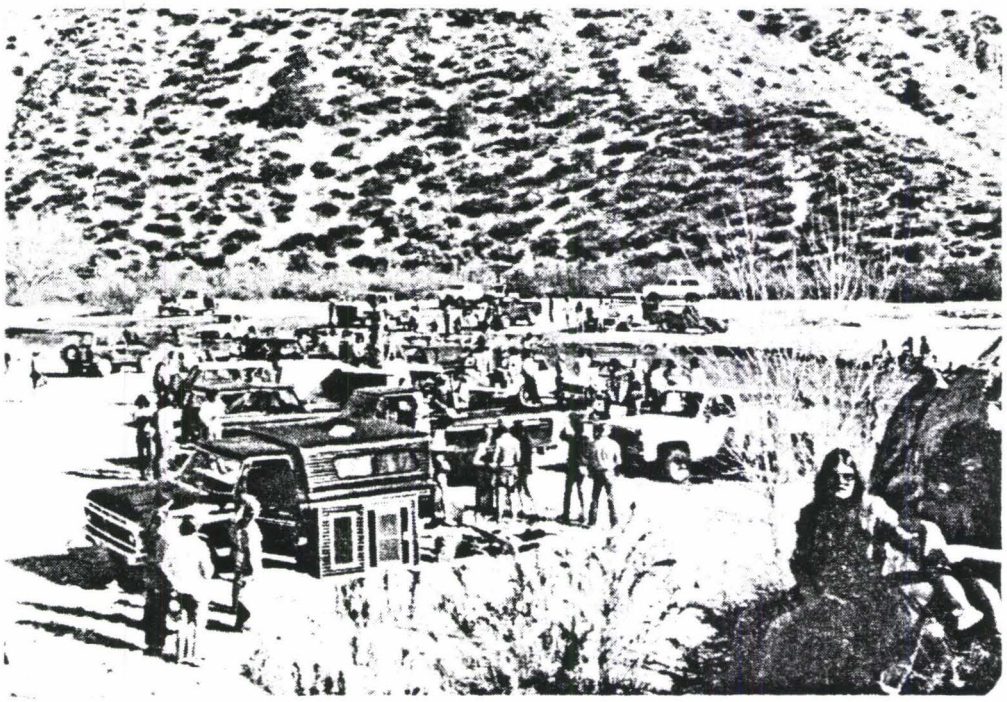


Example of high density
campground - Plan View

APPENDIX G

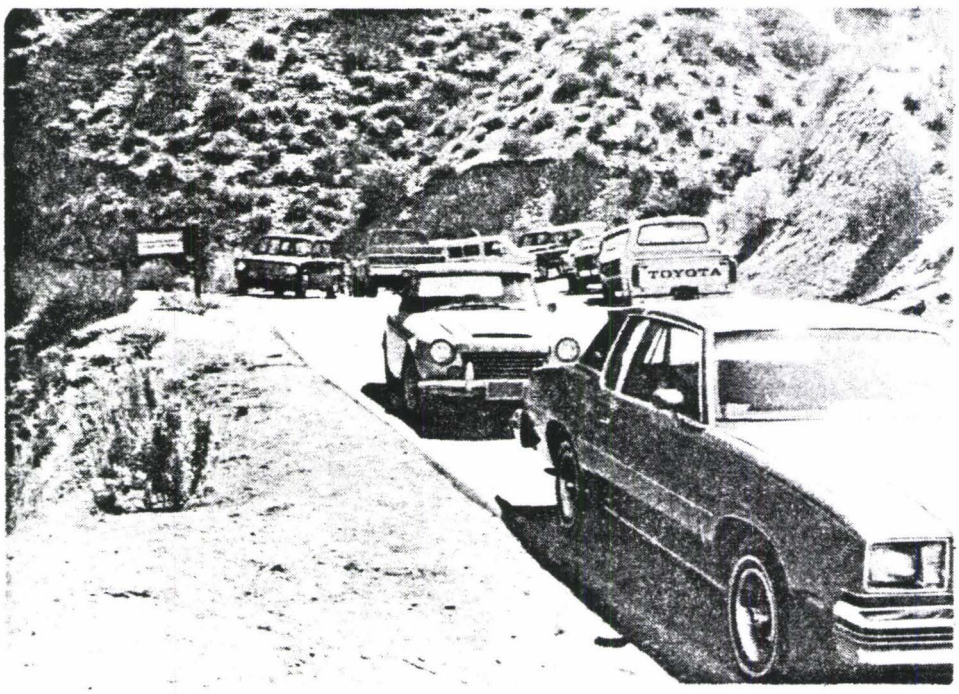


Forest Service Road in Front of Littlerock Resort



Recreation Use in ORV Open Area

Four Wheel Vehicle in Campground



Forest Service Road Parking and Congestion